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ABSTRACT

A TOOL FOR STAFF INVOLVED IN SCHEDULING FOR THE SMALL HIGH SCHOOL, THIS GUIDE TAKES A LOOK AT PRIORITIES, SCHEDULE DESIGN AND IMPLEMENTATION, BUILDING THE MASTER SCHEDULE, AND RESEARCH APPROACHES FOR BETTER SCHEDULING. SPECIFIC TEACHER AND STUDENT RESPONSES TO VARIOUS SCHEDULES ARE TABULATED. METHODS OF DATA ANALYSIS ARE PRESENTED WITH SAMPLES OF CLASS AND SUBJECT SCHEDULES. STAFF AND STUDENT QUESTIONNAIRES ARE REPRODUCED IN FULL. NOT AVAILABLE IN HARD COPY DUE TO MARGINAL LEGIBILITY OF ORIGINAL DOCUMENT. (BD)

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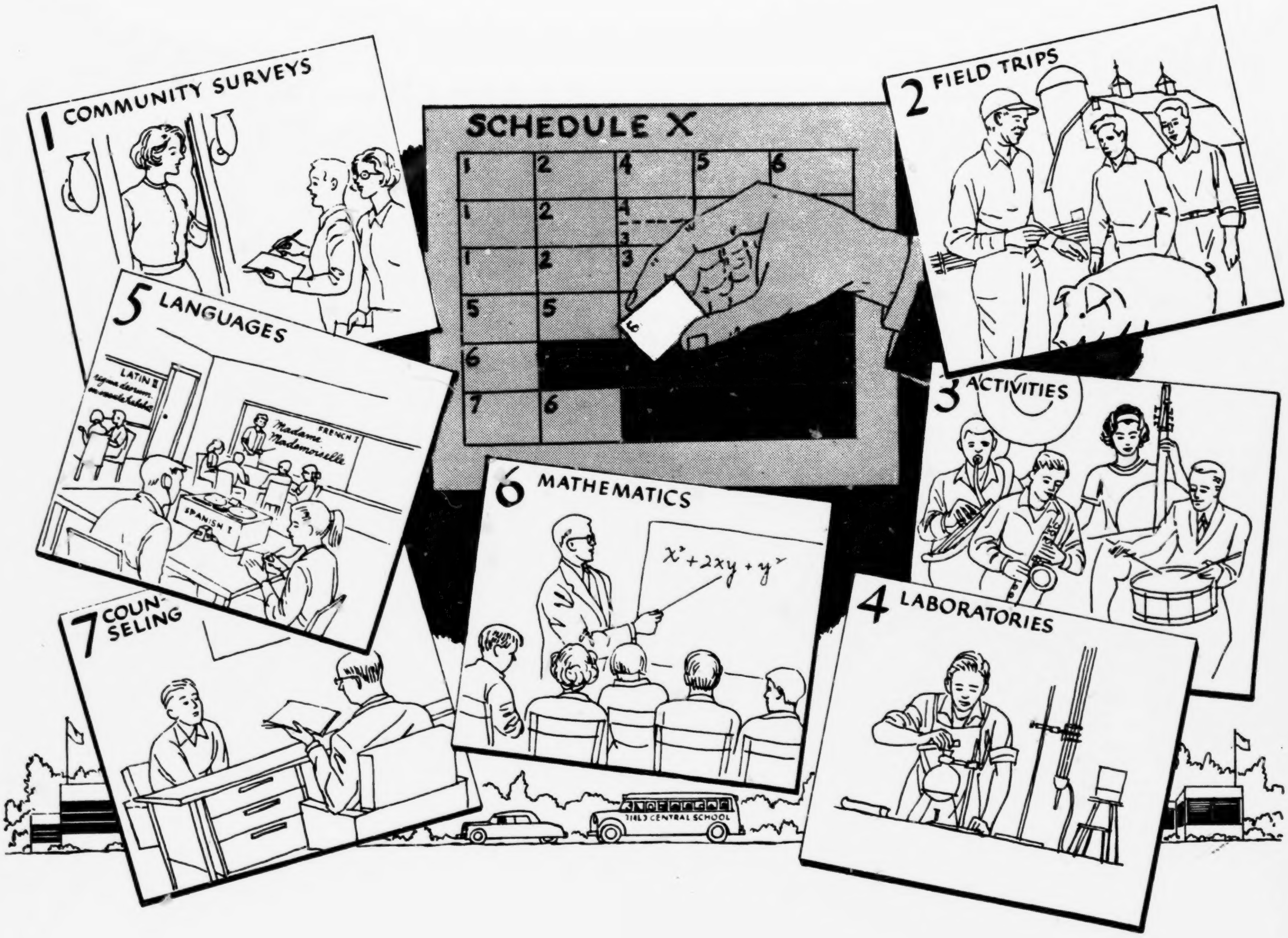
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GUIDEBOOK ON FLEXIBLE SCHEDULING

A Report of the

Study Group on Flexible Scheduling

CATSKILL AREA PROJECT IN SMALL SCHOOL DESIGN
215 Home Economics Building
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July, 1959

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TABLE OF CONTENTS

CHAPTER PAGE

I. Introduction 1

- The Struggle for Comprehensiveness 1
- Scheduling Principles. 5
  - Comprehensive Offerings 5
  - Longer Periods 5
  - Variability 8
- Definitions 8
- Perspective 10
- Staff Participation in Schedule Development . 13
- Scheduling as a Means--Not an End 16

II. PRIORITIES 18

- Priority Questions Related to the Scope of the School's Program 18
- Priority Questions Related to Learning Activity 18
- Priorities Related to Scheduling 19
  - Course Offerings 20
  - Length of Periods 26
  - Frequency of Classes 30
  - Provision for Study 33
  - Floating Periods 38
  - Scheduling the Activity Program. 41
  - Facilities 43
  - Number of Periods 44
  - Length of School Day,Week and Year 45
  - Schedule Variability 46
- Dilemma and Challenge 48

III. SCHEDULE DESIGN AND IMPLEMENTATION 49

- Six-Period Schedule in a Five-Period Day . . . 50
- Seven-Period Schedule in a Six-Period Day . . 54
- Schedules Designed for a Seven-Period Day . . 57
- The Eight-and Nine-Period Day 60
- The Concentration, or Single-Subject Plan . . 63
- Combination of Concentration and Conventional Scheduling 65
- A Four-Period Day Featuring "Majors" and "Minors" 68
- The Modular Schedule 70

CHAPTER PAGE

IV. BUILDING THE MASTER SCHEDULE 76

Steps in Schedule-Building 77
Application of an Electronic Computer to Scheduling Operations 79
The Use of Marginal Punch Cards in Scheduling 82

V. TOWARD BETTER SCHEDULES AND SCHEDULING 85

Recommendations 85
  Need for Self-Study 88
Experimentation in Local Schools. 88
  Identification of the Problem. 89
  Development of a Hypothesis. 90
  Preliminary Planning 91
    Questions about Involvement 93
    Other Planning Considerations 93
    Accumulation of Evidence 94
  Practice and Appraisal 95
The Task Ahead 98

BIBLIOGRAPHY 100

APPENDIX A. Student Questionnaire 106

APPENDIX B. Staff Questionnaire 112

APPENDIX C. IBM Schedule Forms 121

LIST OF TABLES

TABLE PAGE

I. School Organization Characteristics Reported on the New York State Education Department's 1958-1959 Secondary School Report Forms by 161 Central Schools with Less Than an Enrollment of 1000, k-12 11

II. If You Taught Under the Old Schedule, Has the Present Schedule Caused You to Change the Way You Organize Learning Activities? 15

III. Relationship Between the Size of the High School, Grades Nine Through Twelve, and the Number of Different Courses Offered in Twenty-one CAP Schools in 1953-1954 21

IV. Selected Characteristics of Size, Number of Different Courses, and the Number of Different Secondary School Classes Conducted in Twenty-one CAP Schools in 1953-1954 22

V. Average Size of CAP Classes (1953-1954) with Less Than Fifteen Pupils and the Distribution of the Classes in Grades 9-12 According to Course Title 24

VI. Two Hundred Thirty-Seven Teacher Responses Concerning Period Length 27

VII. Replies from 212 Teachers to the Question, "Does the Present Schedule Provide Enough Time for you to Work With Students?" 28

VIII. Teacher Replies to the Question, "If There Has Been a Basic Change in the Master Schedule, How Does the Present Schedule Compare With the Old One Regarding the Amount of Time for Working With Students?" 29

IX. Replies of 168 Seniors to the Question, "Are You Able to Get as Much Help from Teachers under the Present Schedule as You Did under the Old One?" 29

X. Seniors' (100) Reply to the Question, "In General, How Do You Like the Present Schedule When It Is Compared to the Former One?" 30

XI. Teachers' (46) Perceptions Related to the Question, "If You Taught under the Previous Schedule Do You Feel that Students Are Learning as Rapidly under This Schedule As under the Old One?" 31

TABLE PAGE

XII. Teachers' (178) Replies to the Question, "Is Continuity of Learning Affected When Classes Meet Less Often than Five Times Per Week?" 32

XIII. Do the Students Have Time to Finish Their Assignments in Class? 34

XIV. Replies of 193 Seniors in Seven Schools to the Question, "What Suggestions Do You Have for Schedule Improvement?" 35

XV. Replies of 193 Seniors to the Question, "Do Your Teachers Generally Set Aside a Part of the Regular Class Period for Supervised Study?" 36

XVI. Reactions of 97 Seniors to New Schedules Which Feature 57- or 58-Minute Periods (Old Schedules Used Periods of 45 Minutes) 37

XVII. Replies of 234 Teachers to the Question, "Which Best Describes the Characteristics Which You Feel Are the Advantages and Disadvantages of Supervised Study?". . . 38

XVIII. Seniors (193) Respond to the Question, "Do You Like the Idea of Classes Changing Their Position in the Schedule from Day to Day during the Week?" 39

XIX. Two Hundred Twenty-Nine Teacher Responses to the Question, "What Is Your Opinion of Schedules in Which Classes Revolve or Change Position in the Schedule from Day to Day during the Week?" 40

XX. Replies of Seniors to the Question, "Is There Enough Time for Extra-Curricular Activities under the Present Schedule as Compared to the Old One?" 42

XXI. Typical Load of the Teachers According to the Number of Periods per Week 44

XXII. Relationship Between the Number of Modules, Length of Periods, and the Number of Periods in a Six-Hour School Day 70

XXIII. Teacher Responses (70) to the Question, "In General How Do You Feel that the Present Schedule, When Compared to the Previous One, Affects Teaching and Learning?" . . . 91

TABLE PAGE

XXIV. Teacher Responses (75) to the Question, "Has the Schedule Change Affected Your General Satisfaction with Your Job?" 91

XXV. Eighteen Teacher Responses (from the "No Involvement" Schools) to the Question, "In General How Do You Feel that the Present Schedule, When Compared to the Previous One, Affects Teaching and Learning?" 92

XXVI. Seventeen Teacher Responses (from the "No Involvement" Schools) to the Question, "Has the Schedule Change Affected Your General Satisfaction with Your Job?". . 92

LIST OF FIGURES

FIGURE PAGE

1. Sample Schedules for Four Teachers in Small School Using a Modular Schedule 72
2. Portion of Boy's Marginal Punch Card (Clipped) . . . 83
3. Cards Aligned 83
4. Needle Inserted 83
5. Needle Lifted to Separate Girls' and Boys' Cards . . 83
6. A Portion of a Schedule Which Shows Three Teachers Assigned to 22 Classes and One Study Hall Within Sixteen Periods 97
7. Illustration of IBM Form 1, Course Offerings (Portion only--Actual Form Lists 124 Different Courses) . . . 122
8. Illustration of IBM Form 2, Course Registration by Year (Portion only) 123
9. Illustration of IBM Form 3, Course Conflict Chart (Portion only) 123
10. Illustration of IBM Form 4, Hourly Load by Class--Sophomores (Portion only) 123
11. Illustration of Form 5, the Master Schedule (Portion only) 124
12. Illustrations of IBM Form 6, Student Schedule (Portion only--Wednesday and Friday are the same as Monday; Thursday is the same as Tuesday) 125
13. Illustration of IBM Form 7, Teacher Schedule (Portion only--Wednesday, Thursday and Friday are the same as Monday and Tuesday) 125
14. Illustration of IBM Form 8, Room Schedule (Portion only --Wednesday, Thursday and Friday are the same as Monday and Tuesday) 126
15. Illustration of IBM Form 9, Class List 126

CHAPTER I

INTRODUCTION

The Guidebook on Flexible Scheduling is designed to assist staffs to conduct studies of their own master schedules. Although there is no single answer to the scheduling problems of small high schools, the Guidebook is continually concerned with schedules which appropriately fit educational programs in unique settings rather than schedules which serve as molds into which are forced the learning programs of youth.

Inasmuch as most scheduling problems are centered upon the upper four grades of the small secondary school, the Guidebook confines its attention to this area where electives complicate small school organization.

The Guidebook represents two years of deliberation of the Study Group on Flexible Scheduling.* It incorporates most of the ideas loosely compiled in a first draft in May of 1958. It reflects the judgments emanating from schedule experimentation by CAP schools, from a study of the results of questionnaire returns from 193 seniors in seven schools and 234 teachers in nineteen schools, from a few sessions shared with expert consultants, from observation of experimentation in areas other than scheduling, and from the monthly sessions the members of the Study Group on Flexible Scheduling have shared to discuss common problems.

Schedule changes affect an entire school. Perhaps this explains why there has not been more experimentation. Perhaps it explains why those schools which are experimenting deserve special commendation. The Guidebook may enable schools to use schedule study as a vehicle for extensive appraisal of educational programs available to youth in grades nine through twelve.

The Struggle for Comprehensiveness

The master schedule of a secondary school is the organizational framework upon which is spread a school's resources of time, space, teachers and students for the appropriate handling of the educational program. The basic design of that framework has changed little from the beginning of the century despite the secondary school's change from a narrow, college-oriented institution to the modern comprehensive high school. Especially affected by this paradox has been the small school.

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*Hereinafter referred to as the "Study Group."

The almost explosive expansion of secondary education was characterized, among other things, by the establishment of many small high schools in rural America. They were created in the image of their older city cousins and in the tradition of the famous 1892-1893 NEA Committee of Ten which assumed that preparation for life and preparation for college are synonymous.[1] But as the secondary school programs of the country began to yield to the desires of the people the principals of small high schools found it more and more difficult to deploy the talents and energies of a few teachers to match the instructional potential of larger staffs.

The Guidebook assumes that CAP schools and high schools in general should be comprehensive. This assumption springs directly from the basic purpose of the Project--"to improve the variety and quality of education in small high schools."[2] It reflects that which is characteristically American in secondary education.

> Since throughout most of our history secondary schools were established while the community was still small, one school to a community has become the rule. While it has not always provided a program wholly suitable to all the youth of the community, the trend has been toward offering a broader and broader program. It has become a school committed to the education of all youth without segregation on the basis of sex, socio-economic class, intelligence, or future vocational or educational plans.[3]

At a later point in the same article French writes:

> This broad program, then, is not an outgrowth of modern or "progressive" education. It is not an evil that has

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[1] Charles W. Eliot, Chairman, Report of the Committee on Secondary School Studies Appointed at the Meeting of the NEA July 9, 1892: With the Reports of the Conferences Arranged by this Committee and Held December 28-30, 1892, U. S. Bureau of Education, Washington, D.C., Government Printing Office, 1893, p. 51-53.

[2] Catskill Area Project in Small School Design, "The Catskill Area Project in Small School Design," Oneonta, N. Y., The Project, 1959, p. 24.

[3] Will French, "The Role of the American High School," Bulletin of the National Association of Secondary-School Principals, 39:9-10, February, 1955.

> recently crept into our educational system and is about to subvert it. It is instead the fruition of a long term trend that is almost as American as the Fourth of July.
>
> Some of our critics look at this broad program and condemn it as unnecessary; as catering to "fads and frills"; as providing too many electives and, therefore, permitting youth to escape from what are supposed to be the more rigorous subjects. They either do not recognize the breadth of the educational needs and interests which the unselected student-bodies of today's high schools possess or else they are willing to see the needs and interests of an educational elite served while those of other youth are neglected.[1]

Such statements indicate that a broad program of offerings is imperative in the American high school. They do not decry the importance of general education. The Guidebook, however, gives greater attention to program breadth because this is a unique organizational problem for small schools.

Organizationally, the large high school has been able to effectively reconcile the need for a comprehensive program with the time demands of the Carnegie Unit and the assumption that instruction primarily relies upon the exposition and questioning a teacher can direct to groups (classes) of students. This the small high school has not been able to do without unusual expenditures. Some effective adaptation to the needs of students and communities represented by small high schools has occurred in the fields of vocational agriculture, vocational homemaking and business education. There has been effective, but infrequent use of correspondence courses in various fields. But endeavors to increase the variety of learning often resulted in the adoption of eight-or nine period days. The highly segmented day in small schools was supposed to spread the talents of small staffs over more courses, and short periods forced concentration upon "class-oriented" instruction and discouraged creative teaching in a school setting inherently geared to informality, to small group and individual learning.

Can the small high school successfully operate as a comprehensive high school? In The American High School Today, Conant writes the following:

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[1] Will French, "The Role of the American High School," Bulletin of the National Association of Secondary-School Principals, 39:14-15 February, 1955.

> The enrollment of many American public high schools is too small to allow a diversified curriculum except at exorbitant expense. . . The prevalence of such high schools--those with graduating classes of less than one hundred students--constitutes one of the serious obstacles to secondary education throughout most of the United States.[1]

The Study Group on Flexible Scheduling does not discount the value of reasonable size in school enrollment. It does, however, disagree with the view of Conant and many other educators that school district reorganization is the only avenue to effective comprehensive education in rural areas and in small communities. The need for continued progress in school district reorganization does not alter the fact that the existence of many small high schools is appropriate, and it does not lessen their obligation to provide high-quality education compatible with the needs of the pupils and the communities they represent. Conant's assumptions are based upon the traditional concept of school organization, a concept indicating that comprehensiveness demands a high degree of specialization, that instruction must be in a setting which facilitates homogeneous ability grouping. He gives much greater stress to the differentiation function of the high school than he does to its function of integration. He would use the homeroom and the social studies classes to achieve a social setting upon which to build democratic values. The school day should be compartmentalized into seven or eight periods.

As a part of the over-all effort of the Catskill Area Project in Small School Design the Study Group on Flexible Scheduling looks toward a method of school organization which emphasizes staff and facility versatility and focuses upon individual learning rather than class instruction. The educational program must encompass more than preparation for college. (Twenty-nine per cent of CAP's 1958 graduates entered degree-granting institutions.)[2] Unless the small high school seeks earnestly to escape the bonds of tradition and imitation it is, as Conant indicates, "too small to allow a diversified curriculum except at exorbitant expense," and its success is often limited to those who can benefit from a narrow, college-preparatory program.[1] Such a program is inadequate because a school which is the only public high school available to the youth of a community must serve well the needs of all educable youth or it contributes to the nation's most tragic waste, undeveloped human resources.

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[1] James Bryant Conant, The American High School Today: A First Report to Interested Citizens, New York, McGraw-Hill Book Co., 1959, p. 77.

[2] From Secondary School Report forms of the New York State Education Department, Albany, September, 1958.

Scheduling Principles

The Study Group does not pretend to be close to achieving the absolute schedule ideal in which each student would follow the learning program uniquely appropriate for him, but it nonetheless regards the ideal as an important beacon. It is consistent with the idea that the schedule, as an administrative device, should effectively marshal resources to facilitate the achievement of the school's purposes. Within the context of the ideal and the idea three principles have been assumed with respect to scheduling for small high schools.

It would be difficult and probably undesirable for the members of the Study Group to agree on a more narrow set of principles, because schedules should reflect the educational philosophy of the staffs they serve. It should be expected that the members of the Group would share the viewpoints of the schools they represent.

Comprehensive offerings

Schedule design must make it possible for students to have a greater variety of educational experiences than is usually available in the small high school. The Study Group's feeling about the first principle has already been presented. It agrees with Conant that the American public high school should be comprehensive, but believes that comprehensiveness has not yet been proven unattainable in high schools with fewer than 100 in the graduating class. Empirical evidence would indicate, however, that it is unattainable by adhering to traditional organization. If the small high school is to be comprehensive its organization must change--it must have a new design.

Longer periods

Schedule design must provide that most periods be longer than the forty-to forty-five minute periods customary in small schools in order to enhance increased personal interaction between the teacher and the individual student. Perhaps the most notable exception to Study Group members' reflections of their own schools is in relation to the principle referring to longer periods. Most of the schools in the Catskill Area Project in Small School Design use the eight-period day. Nevertheless, most (not all) of the members of the Study-Group endorse the second principle and look toward the time when the daily schedules of their schools will contain fewer and longer periods.

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[1] James Bryant Conant, The American High School Today: A First Report to Interested Citizens, New York, McGraw-Hill Book Co., 1959, p. 77. (Conant's definition of the "small high school" would apply to all CAP schools--the graduating class of each is smaller than 100 students. The largest graduating class among CAP schools in 1958 consisted of 49 students.)

Their position is substantiated by literature references to the superiority of longer periods. In 1933 and 1934, a controlled study was conducted in the Mount Vernon (N.Y.) High School to compare the results of class instruction for 110 minutes and eighty minutes to those obtained in the typical instructional pattern of forty-minute periods.[1] The longer periods were used over fewer weeks in order that the total amount of class time was about the same in all three plans. In this particular experiment the eighty-minute periods were liked by the teachers and provided the best results in achievement. Other outcomes were increased participation in activities, better teacher-student relations and decreased amounts of homework.

On the basis of achievement-test results, performance in nine high school subjects was superior in longer periods, according to an Iowa experiment involving 32 schools.[2] Even physics achievement was slightly superior (not statistically significant, however) despite the comparison of five of the longer (55 to 60 minutes) periods to seven of the shorter ones (40 to 45 minutes). In an article by Koos and Troxel, results of approximately 300 observations indicated that short classes featured traditional recitation procedures not only a higher percentage of total class time, but more actual minutes per period than did the longer periods.[3] The period lengths being compared were the same as those in the Iowa study. Observations revealed that longer periods were characterized by more supervised study and more "other activities," the latter apparently related to the variety of teaching techniques observed.

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[1] Hugh H. Stewart, A Comparative Study of the Concentration and Regular Plans of Organization in the Senior High School, Contributions to Education No. 600, New York, Bureau of Publications, Teachers College, Columbia University, 1934.

[2] G. E. Denman and T. J. Kirby, "The Length of the Period and Pupil Achievement in High School," School Review, 41:284-89, April, 1933.

[3] Leonard V. Koos and O. L. Troxel, "A Comparison of Teaching Practices in Short and Long Class Periods," School Review, 35:340-53, May, 1927.

Education for All American Youth, the 1944 publication of the Educational Policies Commission proposed the extension of the school day to allow for seven 55 minute periods, and it was suggested that certain studies would extend for more than one period for at least part of the school year.[1] Such a recommendation was also made in a United States Office of Education pamphlet relating to the small high school.[2] Mackenzie claims that relatively long, two- to three-hour periods have been experience-tested and found to be of great value.[3] A long-period schedule suggested by Gorman was preceded by the statement that the short-period segmented day is ". . .seriously out of harmony with relatively modern discoveries about the learning process."[4]

T. H. Bell, former superintendent at the Rockland (Idaho) Public School, introduced a schedule which featured a long three-hour period in the morning and four short periods in the afternoon.[5] The courses following the morning concentration plan were completed in twelve weeks. The schedule suggestions in Developing a Curriculum for Modern Living reduce the school day to three periods.[6] The authors' recommendations refer primarily to problem-teaching in core situations, but they are not inapplicable to the curricula of CAP schools, despite their subject matter orientation.

The evidence about which the Study Group is most concerned, however, with respect to length of periods and other schedule characteristics is that arising from local study. Although it is clear that the "schedule perceptions" of students and teachers vary from school to school, it is also clear that the overwhelming majority of both teachers and students now in the Project schools which are using longer periods are in favor of them.

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[1] Educational Policies Commission, Education for All American Youth, Washington, D. C., NEA, 1944, p. 151.

[2] Walter H. Gaumnitz and Wilbur Devilbiss, Cooperative Planning: The Key to Improved Organization of Small High Schools, U.S. Office of Education, Pamphlet No. 102, Washington, D.C., Government Printing Office, 1947, p. 4.

[3] Gordon N. Mackenzie, "High School Education for Better Personal and Community Living," Bulletin of the National Association of Secondary School Principals, 139:30-31, May, 1946.

[4] Burton W. Gorman, "The High School Schedule," The American School Board Journal, 126:49-51, March, 1953, p. 49.

[5] Maurice L. Hartung, "A Modified Schedule in a Small High School," School Review, 61:516-17, December, 1953.

[6] Florence B. Stratemeyer, Hamden L. Forkner, Margaret G. McKim and A. Harry Passow, Developing a Curriculum for Modern Living, Second Edition, Revised and enlarged, New York, Bureau of Publications, Teachers College, Columbia University, 1957, p. 402.

Variability

Schedule design and implementation must facilitate changes in the organization of school days or weeks from time to time if learning advantages would accrue. Some members of the Study Group on Flexible Scheduling deny the possibility of a "flexible" schedule and are reluctant to endorse the third schedule principle adopted. However, there is complete accord upon the importance of flexibility in the educational program. Field trips, camping, conventions, community surveys and studies, assemblies and a great many other important endeavors do not lend themselves to the confines of the typical master schedule. A schedule which may be easily shifted or temporarily replaced could facilitate flexibility in the learning program. Even though there is some disagreement as to whether or not schedule flexibility can successfully be achieved in practice, the concept is a crucial one. Thus, the word "flexible" was retained in the title of the Guidebook.

Definitions

Literature on scheduling does not contain a standard set of clear-cut definitions of scheduling terms. Most of the terms have come into relatively common use and are generally correctly understood, but there are some ambiguities, some inappropriate interchange of verious terms. The Guidebook and another study currently underway and soon to be published concur generally upon a set of arbitrary definitions.[1] Of particular concern has been the indiscriminate use of the terms "rotating schedule" and "X period." The term "block scheduling" is also confusing at times, because its increasing use in junior high schools adopting long periods touches upon "blocks of time" as well as "blocks of students." The limitations associated with the arbitrary definitions set forth below may in some instances depart from hitherto accepted terminology, but they should promote accuracy of schedule discourse. The definitions which follow are used in the Guidebook.

"Type of schedule" - Refers to the pattern of time allotments. The number of scheduled periods per day or week, the length of the periods, whether or not they float or are locked, and planned possibilities for variations of time allotments are characteristics usually associated with schedule type. (When counting the number of periods in a schedule, the lunch period is not included unless classes or activities are also scheduled then.)

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[1] David B. Austin and Noble J. Gividen, The High School Principal and Staff Work Together on the Schedule, New York, Bureau of Publications, Teachers College, Columbia University, (in press).

"Floating-period schedule" - One or more periods float. When all or most of the periods float this schedule is similar to a revolving schedule.

"Revolving schedule" - All or most of the periods change position in the schedule from day to day in order to balance "optimun-minimum" learning times or to avoid the monotony of having the same schedule routine each day. This term and the preceding one, "floating-period schedule," eliminate the necessity for ambiguous use of the term, "rotating schedule."

"Rotating schedule" - A schedule which, in part or as a whole, may be rotated ninety degrees to change from a horizontal to vertical (or vice versa) distribution of classes. When a part or the entire schedule is rotated from horizontal to vertical, a given period is extended from its customary length to that of two, three, or more periods (examples in Chapter III). This definition of "rotating schedule" is derived primarily from a schedule formerly used at East Hampton (Connecticut) High School and it is differentiated from those schedules which may contain one or more floating periods or revolving periods, often heretofore referred to in the scheduling literature as "rotating."[1]

"Schedule flexibility" - Schedule adaptability to change. A rotating schedule and one which has X periods which may be easily interchanged with other periods are examples which lend themselves to flexible use.

"Supervised study" - Individuals or small groups study within the classroom during an assigned class period. This is differentiated from the "recitation" part of the period--that part traditionally devoted to group instruction.

"Schedule-cycle" - Time through which the unit upon which the schedule is based must extend. The usual cycle is the day or week, but possibilities are restricted only by the mastery of tradition over imagination.

"Concentration plan" - Long daily periods (usually three or more hours) extend over a relatively short calendar time.

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[1] Grace S. Wright, Walter H. Gaumnitz and Everett A. McDonald, Jr., Education Unlimited: A Community High School in Action, U.S. Office of Education, Bulletin 1951, No. 5, Washington, D.C., Government Printing Office, 1951.

"Block of Time" - A long period, usually two or more "regular" periods in length. These long periods are usually designed for core offerings or concentration plans.

"Locked period" - Occurs at the same time each day it is scheduled.

"Floating period" - Moves about or occurs at a different time in the schedule from day to day.

"Dropped period" - The absence on a given day of that period which is usually scheduled.

"X period" - A period which sometimes appears as a "hole" in the schedule because it does not represent a regularly scheduled daily period. If regular class periods consume 28 of the 30 weekly periods in a schedule based upon a six-period day, the two remaining X periods might be used to schedule activities, homerooms, assemblies, or they may be uncommitted. As here defined, the X period eliminates the need for the term "Z period," sometimes used in the literature.

"Group scheduling" - Scheduling by groups rather then by individuals. The introduction of this term avoids the necessity of using "block scheduling," a traditional term, but one often confused with "block of time." Group scheduling is often used in scheduling junior high schools and in the general education portion of high school scheduling.

"Mosaic scheduling" - Scheduling derived from individual student and teacher programs. Trial-and-error procedure is often associated with the manipulation of tags or marks into a mosaic pattern on a master board or grid.

"Combination scheduling" - Combination of group and mosaic scheduling.

Perspective

Scheduling practices in the 22 CAP schools are generally like those of the other 219 central schools in New York with enrollments under 1,000. Table I depicts comparisons drawn from a survey of reports filed with the New York State Department of Education (September, 1958)covering 139 schools in addition to those in CAP. The eight-period day is about as prevalent in the central schools today as it was in the small midwestern high schools in 1936.[1] The influence of

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[1] A. W. Clevenger, "The Long Period Daily Class Schedule for High Schools," North Central Association Quarterly, 10:456-61, April, 1936.

TABLE I

School Organization Characteristics Reported on the New York State Education Department's 1958-1959 Secondary School Report Forms by 161 Central Schools with Less Than an Enrollment of 1000, Grades K-12

Characteristic	22 CAP Schools	139 Other Schools
Plan of organization		
K-6-6	17	94
K-8-4	3	34
K-6-3-3	1	7
K-7-1-4	1	0
K-6-2-4	0	1
(Omitted)	0	3
Enrollment, 7-12		
Range	96 to 392	43 to 438
Median	213	225
Typical starting time	8:45	8:45
Typical dismissal time	3:25	3:30
Total number of daily periods (excluding lunch)		
Six	4	4
Seven	5	9
Eight	12	107
Nine	1	19
Number of activity periods		
One each day	15	102
Two each day	1	10
One per week	1	5
Two per week	3	4
Six per week	1	0
Seven per week	1	0
None	0	18
Length of periods		
40-45 minutes	13	120
46-50 minutes	5	13
51-58 minutes	4	4
Variation		2

TABLE I (continued)

Characteristic	22 CAP Schools	139 Other Schools
Length of lunch period		
Median	45 minutes	30 minutes
Mode	45 minutes	30 minutes
Number of homeroom periods, Grades 7-8		
One per week	12	51
Two or three per week	1	7
One each day	0	11
One every two weeks	2	9
None	7	61
Number of activity periods, Grades 7-8		
One each day	6	53
One each week	3	28
Two or three per week	11	13
One every two weeks	0	5
None	2	40
Number of weekly periods for biology, chemistry and physics (if more than five)*		
Biology		
Six periods	3	23
Seven periods	1	13
Eight periods	0	2
Ten periods	0	1
Chemistry		
Six periods	3	27
Seven periods	1	15
Eight periods	0	2
Physics		
Six periods	2	20
Seven periods	2	14
Eight periods	1	3
Ten periods	0	1
Number of weekly periods for physical education		
Two or three per week	17	121
Four or five per week	5	18

*Tabulations shown under this item were obtained from responses to this statement: "List below the courses which meet . . . more than five periods a week." [Item III, 2, (d) on the Secondary School Report form] Agriculture was scheduled for eight or ten periods in 48 schools.

a few CAP schools keeps the domination of the short-period segmented day from being more impressive. Although only 22 of the 161 schools surveyed have less than an eight-period day, nine of them are CAP schools. These nine are among 18 schools which have periods longer than 45 minutes.

Staff Participation in Schedule Development

Schedule development, as an almost endless series of decisions which have a pervasive influence upon the educational program and all those concerned with it, should be shared by the principal and the staff. This has not been customary in most high schools. Schedules are usually made by the principal or delegated to the vice-principal or guidance counselor without the expectation that there would be considerable staff study and involvement in decisions to be made. From the time of Puckett's study which indicated that more than two-thirds of the schedules in 1930 were made by the principal alone, through Devilbiss' doctoral study in 1946, there was little indication that the schedule was considered a cooperative enterprise.[1] Devilbiss sees the schedule as quite important to teachers in that their morale is affected by load distribution, but he does not indicate that teachers should actually share in schedule study and development.[2]

A survey of scheduling literature appearing in periodicals since 1946 has revealed few articles in which teacher involvement in schedule development is considered of major importance.

"The principal as an educational leader must help teachers understand that his position exists to facilitate their task of helping students learn."[3] If his primary task is the improvement of the instructional program and the improvement of conditions under which teaching and learning take place, neither the principal nor his representative (vice-principal or counselor) can successfully exclude the resourcefulness of his colleagues and limit decisions to the domain of their own perceptions. Scheduling impinges upon the teachers' job in many different places, and schedule designers (particularly in a small high school) know that it is rarely possible to transfer a class from one teacher to another without affecting the teaching assignment or the organization of the school day for one or more of the other teachers. Teacher involvement in schedule studies is necessary to get the views of the study area specialists whose programs will be affected by decisions, and it is perhaps the best way to enlarge teacher perspective so that the individual staff member sees his job in appropriate relationship to the total school setting. The informal setting inherent to small schools enhances the liklihood that schedules may be redesigned cooperatively and be accepted by all or most of the staff.

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[1] Roswell Puckett, Making a High School Schedule of Recitations, New York, Longmans, Green and Co., 1931, p. 70-71.

[2] Wilbur Devilbiss, Criteria of a Good Master Schedule with Special Reference to Small and Medium-Sized High Schools, Doctor of Education Dissertation, Washington, D.C., The George Washington University, 1946, p. 12-13.

[3] Elwood L. Prestwood, The High School Principal and Staff Work Together, Secondary School Administration Series, David B. Austin, Editor, New York, Bureau of Publications, Teachers College, Columbia University, 1957, p. 26.

Dr. David B. Austin has suggested that others than the teaching staff of the school may have helpful information to contribute to the background of considerations appropriate for schedule decisions.[1] The kitchen and lunch room staff should know better than others how rapidly lunch lines move. The bus drivers should have the best information on driving times, the practicable time to begin pick-ups and the latest acceptable time for discharging pupils in the late afternoon. Custodians and office workers may have had the best observation of hall traffic problems. Thus schedule discussion with these people is important. Most of it will be in one or two informal sessions with individuals or small groups rather than in a series of sessions such as the professional staff would use to study schedules.

In most CAP schools, schedule study is the responsibility of the guidance counselor but the principal, as the educational leader of the school, should maintain an active interest in schedule proceedings. Although he should not lack confidence in his staff and be afraid for the counselor to meet with the teachers, he should be welcome at all meetings and he should communicate often with the counselor. Close touch with the staff is necessary because it is inappropriate for the principal to abdicate responsibility for making final decisions on schedules. Certainly most recommendations which come from sound group approaches to problems should be accepted. This does not discount, however, the unique perspective and the unique responsibility of the principal. Occasionally he or the counselor may see the wisdom of saying to the staff something like this:

"After our studies together and after considerable personal attention to your recommendations, I wish to report full agreement on points A, B, C, F, and H. There are still appropriate reservations, it seems to me, about point D and I would appreciate your giving it further study before disposition is made of it. Point G cannot be made operative at this time."

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[1] Information obtained from a recording of Professor Austin's speech to the 1957 Work Conference on Rural Education, Teachers College, Columbia University.

Justifiable reasons should then be given for not accepting point G—the action should not be defended via status alone. The principal or counselor should thank the teachers sincerely, indicate that their recommendations were superior to those he would have personally made, and he should again request continued study of point D.

A schedule should and usually does reflect the philosophy of the staff it serves. Alterations in schedules should result from new perceptions, changes in philosophies of youth education. The Study Group leans toward the feeling that it is unwise to change the schedule in the hope that it will change the behavior of teachers, but this sometimes happens.

Analysis of teachers' reactions to new schedules in CAP schools confirms the belief that perceptions are not as easily changed as are schedules. From 65 replies of teachers in schools which changed to schedules with a significant difference in period length and frequency only 24 indicated that they had changed the way in which they "organize learning activities." (See Table II.) Interviews with the guidance counselors and principals of four schools which adapted longer periods revealed their concern that many teachers had not changed classroom practices. Not one of the eight interviewees indicated that longer periods were sufficiently used for supervised study or individualized instruction—the two main reasons for the change in their schedules.

TABLE II

If You Taught Under the Old Schedule, Has the Present Schedule Caused You to Change the Way You Organize Learning Activities?

a. Replies from schools whose principals and guidance counselors were interviewed.

Yes	24
No	34
Omit	7

b. Replies from all schools whose schedules changed.

Yes	40
No	55
Omit	17

The interviewees contributed a total of sixteen replies to the questions relating to the reasons for schedule change. Eleven of the sixteen replies pointed to "partial success" in the way teachers had adapted teaching methods, two replies were "neutral" and three persons indicated their schools were definitely "unsuccessful" in achieving changes in classroom procedures. The principals and guidance counselors thought that most of the affirmative replies to "change" questions came from the teachers who actually served on the schedule committees. The other teachers were consulted about schedule changes, they endorsed them in what was apparently a democratic atmosphere, but they had not gone through the actual studies leading to change. Such observations would lead to agreement with Corey's more precise studies of action research.[1]

The implications for staff involvement in schedule study are significant. Nevertheless, it is quite probable that many of the specialists in group work are correct when they indicate that "process" should not be foremost in group consciousness when a problem study is undertaken. This stand could be accented in schedule studies of small high schools where there is frequent face-to-face contact and easy communication.

> Concentration . . . should be on problems, not on people. We should keep in mind the "human elements" . . . but at the same time always try to think of what needs to be done to a problem growing out of a situation.[2]

Neither the principal nor the person he designates, however, should make the mistake of assuming that the intimacy of a small staff relieves him of the responsibility for developing better insights into group relations and improved techniques in group leadership.

Scheduling as a Means--Not an End

Scheduling, of course, is a means--not an end. No amount of schedule redesign can of itself make good teachers, good methods or good learning situations. Since schedule changes alone do nothing

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[1] Stephen M. Corey, Action Research to Improve School Practices, New York, Bureau of Publications, Teachers Cillege, Columbia University, 1953.

[2] Elwood L. Prestwood, The High School Principal and Staff Work Together, Secondary School Administration Series, David B. Austin, Editor, New York, Bureau of Publications, Teachers College, Columbia University, 1957, p. 83.

for the education of our youth, it is imperative that changes grow out of comprehensive considerations of the educational program. Scheduling will not make the small high school comprehensive--but it can facilitate the making. It will not change teacher orientation from subject matter to students--but it can enhance the change. The schedule cannot provide a more appropriate learning situation--but it can help make the provision possible. Thus, it could be effectively argued that the schedule is of less importance than is the staff study from which it is conceived. The Study Group believes that studies which lead to changed perceptions of teaching and learning will lead to new and better schedules. This belief is paralleled by the conviction that all of the experimental endeavors of CAP will be moved forward toward the point of new small school design--not just piecemeal segments of exploration--when Project schools undertake comprehensive studies which eventuate in new and imaginative schedule design and implementation.

CHAPTER II

PRIORITIES

If a master schedule is a vehicle for the expression of the school's purposes, appropriate regard for the schedule dimensions of time, space and the assignment of students and teachers will grow out of an educational philosophy expressed in answer to basic priority questions. Schedule redesign should be based upon considerations of the scope of the school's program and the nature of the learning activities it encompasses.

Priority Questions Related to Scope of the School's Program

1. What portion of the total educational program of our youth should be the school's responsibility?

2. Should we agree with Robert M. Hutchins that the virtue of the small high school lies in the narrowness of its program, or should we accept Conant's view that public high schools should generally be comprehensive?[1]

3. What should constitute our general education program?

4. If we provide a specialized program, what learning opportunities should it encompass?

5. What priority shall be given to music, to athletics, to homeroom, student council, clubs and other activities?

Priority Questions Related to Learning Activity

Other important questions have to do with the nature of the learning activities within the scope of the school's program.

1. What organization of teaching and learning activities is most consistent with reliable evidence and modern theory about learning?

    a. To what extent do we wish to depart from the somewhat formal traditional pattern of "teacher-class" relationship and adopt other ways of going to a "teacher-pupil" or "teacher-small-group" relationship?

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[1] From statements made on a recorded radio documentary, "The Empty Schoolhouse," Columbia Broadcasting System Radio Network, Edward R. Murrow, Narrator, February 18, 1959.

b. To what extent should teaching and learning be textbook or "information-oriented" when compared to the "experience" orientation of problems, projects and units?

c. To what extent should learning activities go beyond the confines of the classroom or the school building and involve "off-campus" endeavors in community surveys, field trips, excursions, etc.?

2. Where can individual study be best undertaken--in the classroom, the library, study hall or home? To what extent should each of these be involved in school-related study and learning?

3. What are the implications of modern communication devices for the organization of learning activities?

4. What are the implications of very small enrollments for the organization of various electives?

5. If our small high school is to be comprehensive how can a small staff be best deployed and best engaged in assisting in the wide variety of learning activities appropriate to the students of even a very small high school?

6. Should there be any difference in the organization of learning activities associated with the general education program and that of specialized education?

Priorities Related to Scheduling

As staffs formulate answers to the above questions they give expression to educational philosophy which affects their attitude toward an important priority question, "Is the time allotment among the several educational demands--in subject matter and experience--apportioned appropriately to their intrinsic values for the individual and society?"[1] The principal, the guidance counselor and the teachers are then in a position to approach the following questions.

1. What courses or educational opportunities shall we provide?
2. What length or lengths of period should our school use?
3. What should be the frequency of class sessions in the various courses offered?

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[1] Gordon C. Lee, An Introduction to Education in Modern America, Revised edition, New York, Henry Holt and Co., 1957, p. 521.

4. How shall we provide for individual study time?
5. Shall we use floating periods?
6. What should we do about scheduling the activity program?
7. What relationship does scheduling have to facilities?
8. How many periods should be in the school day?
9. What should be the length of the school day, week and year?
10. What are the implications for schedule variability?

The Study Group approaches discussion of these questions with the benefit of 193 student replies and 234 teacher replies to schedule questionnaires.[1] Although the questions are to be studied and answered by individual schools, it is apparent that a master schedule cannot encompass "ideal" replies for each question. Unfortunately schedule designers cannot follow the suggestions of some seniors that schedules provide for more supervised study, more study halls, a longer lunch period and a shorter school day. Not a single school of the 161 central schools surveyed via the New York State Secondary School Report for 1958-1959 uses the earlier-mentioned schedule recommended by the Educational Policies Commission in 1944 (seven 55-minute periods). The typical school opens at 8:45 A.M. and dismisses at 3:30 P.M.[2] The lunch period is usually thirty minutes. The additional 45 minutes required for seven hourly periods would apparently necessitate bus pick-ups and deliveries which are unacceptable to the communities, particularly on winter days with limited daylight. This limitation and others must be continually challenged as more detailed attention is turned to the preceding questions.

Course offerings

In 1953-1954 the New York State Education Department used code numbers to distinguish 135 different offerings which it considered might be made available to grades nine through twelve in the central schools.[3] In that same year data assembled by John Lovegrove revealed that there is a general positive relationship between the size of the high school and the variety of courses offered.[4]

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[1] See Appendices A and B.

[2] See Table I, p. 10

[3] Louis H. Conger, "Study of Class Size in Centrals," A typed report prepared for the Bureau of Statistical Service, New York State Education Department, Albany, July, 1954.

[4] John R. Lovegrove, "A Compilation of Emerging Practices from Small Group Learning Based Upon an Analysis of Small Classes in New York State Central Schools," Doctor of Education Project Report, New York, Teachers College, Columbia University, 1955. (Tables III and IV are based upon raw data Lovegrove assembled for his Project. The information for one school was missing.)

TABLE III

Relationship Between the Size of the High School,
Grades Nine through Twelve, and the Number of
Different Courses Offered in Twenty-one
CAP Schools in 1953-1954

Enrollment Grades 9 - 12	Number of Schools	Median number of courses	Average number of courses
50- 74	4	27	27
75- 99	5	34	32
100-149	8	36.5	36
150-199	1	32	32
200-250	3	48	47

Table III should not be examined in isolation, however, because Table IV clearly indicates that there are several notable exceptions to the size-variety-of-course relationship. (Note that the number of courses offered by CAP schools in 1953-1954 ranged from 24 to 51.) School J, for example offers more courses than eight of the eleven schools in the list which are larger. A check with the New York State Education Department revealed that the primary differences between School J and other schools in its size range were differences of philosophy more than of potential.[1] School J had the highest tax rate and raised more money locally than did the two larger schools. It hired two more secondary school teachers (7-12) than did School O and the same number of teachers as the considerably larger school, R.

Though the differences shown in Tables III and IV may reflect in some measure the differences in the curricular needs of the students as interpreted by those who believe the small school should be comprehensive, it is likely that at least two other influences were much more significant: (a) the extent to which the school believed it appropriate to diversify its program to meet individual needs, and (b) the extent to which the potential of the school, particularly the staff, could be utilized to meet individual needs in a manner the school deemed acceptable.

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[1] Phone conversation with Paul Hedlund, State Aid Analyst, New York State Education Department, April 22, 1959.

TABLE IV

Selected Characteristics of Size, Number of Different Courses, and the Number of Different Secondary School Classes Conducted in Twenty-one CAP Schools in 1953-54.

School	Enroll-ment 9-12	Enroll-ment 7-12	Number of Different Classes Conducted, Grades 7-12, According to Class Size						Number of Different Courses, 9-12
			1-5	6-9	10-14	1-14	15 or more	Total	
A	56	98	2	15	7	24	11	35	24
B	59	103	6	5	11	22	8	30	25
C	68	108	8	11	17	36	19	55	31
D	71	142	11	10	7	28	18	46	29
E	75	131	8	7	10	25	19	44	34
F	89	147	14	6	13	33	27	60	34
G	92	160	5	10	8	23	16	39	25
H	94	168	9	16	8	33	19	52	36
I	97	194	5	5	17	27	41	68	32
J	100	173	7	8	20	35	32	67	40
K	106	171	4	16	12	32	36	68	34
L	110	172	4	18	5	27	37	64	36
M	111	174	8	7	14	29	35	64	36
N	114	208	7	14	18	39	39	78	37
O	117	190	7	12	14	33	38	71	30
P	122	200	3	5	16	24	30	54	37
Q	133	212	4	10	14	28	35	63	39
R	164	289	4	6	15	25	46	71	32
S	209	357	7	7	17	31	72	103	48
T	232	366	0	10	18	28	56	84	41
U	250	397	5	9	9	23	87	110	51
Totals	2469	4160	128	207	270	605	721	1326	732
Median	106	173	6	10	14	28	35	63	34
Average	118	198	6	10	13	29	34	63	35

One of the most sobering factors involved in the small school's struggle to become comprehensive is illustrated by the distribution of classes according to size as shown by Table IV. School J, whose variety of courses exceeded those of School G by fifteen courses conducted twelve more classes with enrollments of fourteen or fewer pupils. The same school offered eight more courses than School R and conducted ten more small classes. Apparently, School J simply placed a higher premium upon comprehensiveness than did Schools G and R. It hired only one more teacher than School G and the same number as School R, but J's teachers were deployed differently.

However, unless some of School J's students were enrolled in a few of the more than 400 correspondence courses available to high school students, the forty courses offered probably fell short of the variety necessary to meet their needs. One must ask whether or not any of the other 95 courses codified for the Lovegrove study or any of those available on the registration form shown in Appendix C, Form 1 (one), would be appropriate supplements to the courses offered at School J as it attempts to react to the demands of the youth it serves.

Perhaps the Study Group is overemphasizing the importance of comprehensiveness for a small school, but the effort to dramatize this aspect of a school's program is deliberate. If a small school does not wish to offer a wide variety of educational experiences, it need not be concerned with this emphasis. CAP schools, however, have evidenced their interest in comprehensiveness because this is one aspect of the Project's basic purpose. And CAP students are concerned with it. Eighty-eight of 193 replies to the student questionnaire checked "offer more subjects" as a suggestion for schedule improvement. If comprehensiveness is an objective of the school, drastic reorganization of learning experiences is in order--small-scale experimental endeavors of CAP must spread to all the schools and they should involve a preponderance of teachers. Correspondence courses, multiple-classes and other arrangements which break with tradition, place increased responsibility on the learner and allow the teacher to shift from the purveying of facts to the energizing and guiding of individuals and small groups--these practices must become the rule in CAP rather than the exception.

Table V shows what areas of CAP curricula might lend themselves best to multiple-class organization insofar as enrollments are concerned. It is obvious that the addition of Russian, calculus, radio and television repair, garage management or other experiences for isolated needs should also be worked out in multiple-classes and/or work experience programs.

TABLE V

Average Size of CAP Classes (1953-1954) with Less than Fifteen Pupils and the Distribution of the Classes in Grades 9-12 According to Course Title*

Course	Number of Classes	Average Size
Agriculture		
Agriculture I	15	8
Agriculture II	13	8
Agriculture II and IV	14	7
Art		
General Art	11	6
Mechanical Drawing	6	8
All other	7	7
Business Education		
Bookkeeping	11	9
Business Arithmetic	4	12
Business Law	5	10
Business Management	2	13
Intro. to Business	8	9
Office Practice	4	6
Salesmanship	2	7
Shorthand I	4	8
Shorthand II	4	8
Typing	19	11
English		
English 9	5	13
English 10	1	13
English 11	1	13
English 12	4	12
Remedial English	1	10
Speech	4	3
Foreign Languages		
Latin I	11	8
Latin II	6	5
Latin III	2	4

*This table is an extension of the Lovegrove data used for Tables III and IV.

TABLE V (continued)

Course	Number of Classes	Average Size
French I	8	8
French II	9	5
French III	2	4
Spanish I	6	8
Spanish II	3	11
Spanish III	3	3
Other Language	1	12
Homemaking		
Homemaking I	10	9
Homemaking II	11	9
Other Levels	27	7
(13 classes with an enrollment of 1-5)		
Industrial Arts		
General Shop	9	9
General Metals	4	8
Other levels	5	7
Electricity	1	12
Mathematics		
Elementary Algebra	6	11
General Math	6	7
Geometry, Plane	12	7
Geometry, Solid	2	4
Intermediate Algebra	15	9
Trigonometry	6	4
Science		
Biology	7	9
Chemistry	5	11
General Science	4	12
Physics	9	8
Social Studies		
American History	1	9
Cit. Education 9	3	13
Cit. Education 11	4	8
Cit. Education 12	6	11

(Note: Tabulations in Driver Education, Health, Physical Education and Music omitted.)

Lovegrove's data were checked to see if the problem of small classes is limited to central schools under an enrollment of one thousand. Sixty-nine per cent of the 5,989 classes below an enrollment of ten were found in this size category in 1953-1954. This dropped to 53 per cent when related to the 9,551 classes which ranged from ten to nineteen pupils. Thus the challenge for different organizational designs is not limited to CAP schools.

The small high school must approach the objective of comprehensiveness through versatility rather than specialization. The criterion for variety in educational experiences can become the needs and interests of pupils rather than the number of classes.

Length of periods

Educational literature about the length of periods was referred to earlier as endorsing, generally, the fifty-five to sixty-minute period. Some references present strong argument and some evidence favoring periods longer than one hour, and three authors have discussed the applicability of the concentration plan to the secondary school. Despite the intrinsic advantages of longer periods for most offerings, the small school's unique need to keep most activities within the regular school day and its effort to minimize conflicts so prevalent when most classes are "singletons," have led to the overwhelming adoption of the eight-or nine-period day and its concommitant--short periods.

The recommendations of Gaumnitz and Devilbiss have been generally unheeded, but some CAP schools have endeavored to break away from the usual pattern and have adopted periods longer than forty-five minutes.[1] Four schools with six-period days and one with seven periods utilize a floating period in order to increase the duration of the individual periods. One school, after trying such a schedule in 1957-1958, dropped it and returned to an eight-period day in 1958-1959.

Preferences for schedules depend upon perceptions, and they in turn are prime products of experience and purpose. It was not uncommon to get opposing student reactions to the same schedule or have teachers from the same school give exactly opposite schedule opinions. Nevertheless, the effect of extreme reactions was decreased when several replies were obtained. Students and staffs of CAP schools using longer periods generally endorse them. Only eight of 56 teachers in these schools reported the academic periods too long, and six of 49 indicated the non-academic periods were too long. (See Table VI.)

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[1] Walter H. Gaumnitz and Wilbur Devilbiss, Cooperative Planning: The Key to Improved Organization of Small High Schools, U.S. Office of Education, Pamphlet No. 102, Washington, D.C., Government Printing Office, 1947, p. 4. (Seven 55-minute periods)

TABLE VI

Two Hundred Thirty-Seven Teacher Responses Concerning Period Length*

a. Replies from schools with periods longer than 45 minutes:

Academic		Non-academic	
Too long	8	Too long	6
Too short	1	Too short	5
About right	47	About right	38

b. Replies from schools with periods of 45 minutes or less:

Academic		Non-academic	
Too long	0	Too long	0
Too short	32	Too short	24
About right	53	About right	23

*The two groups of responses contained a total of 237 replies—more than the number of questionnaires—because a few teachers who teach both academic and non-academic classes contributed reactions for both.

This combined vote of 87 per cent in favor of longer periods is compared to the responses from "short period" schools wherein 58 per cent of 132 replies indicated the duration of classes is "about right." (The two groups of responses contained a total 237 replies—more than the number of questionnaires—because a few teachers who teach both academic and non-academic classes contributed reactions for both.) The difference seems more emphatic if comparisons are made of those dissatisfied with period length. Whereas 42 per cent disliked the shorter periods, only 13 per cent were dissatisfied with long periods. Tables XIII through XVII under "Provision for study" indicate opinion about supervised study, a student and teacher concern which relates positively to longer periods. Tables VII, VIII, and IX show the advantage of longer periods for providing more interaction of students and teachers even in small high schools where face-to-face contacts are frequent irrespective of the schedule used.

TABLE VII

Replies from 212 Teachers to the Question, "Does the Present Schedule Provide Enough Time for You to Work with Students?"

a. Responses of teachers whose schools use 57 or 58 minute periods:

Most of the time	44
Some of the time	11
Rarely	5
Never	1

b. Replies of teachers whose schools use periods from 46 to 50 minutes in length:

Most of the time	14
Some of the time	11
Rarely	6
Never	3

c. Replies of teachers whose schools use periods that are 45 minutes or shorter:

Most of the time	41
Some of the time	36
Rarely	33
Never	7

TABLE VIII

Teacher Replies to the Question,
"If There Has Been a Basic Change in the Master Schedule
How Does the Present Schedule Compare with the Old One
Regarding the Amount of Time for
Working with Students?"

a. Teachers (46) whose schedules changed from short periods (45 minutes or less) to periods of 57 or 58 minutes:

More time in this schedule	35
Less time in this schedule	2
About the same	9

b. Teachers (10) whose schedules changed from longer periods (58 minutes) to periods of 43 minutes:

More time in this schedule	5
Less time in this schedule	1
About the same	4

TABLE IX

Replies of 168 Seniors to the Question,
"Are You Able to Get as Much Help from Teachers under the
Present Schedule as You Did under the Old One?"

a. Students whose schools changed to 57 or 58 minute periods:

More	35
Less	6
Same	55

b. Students whose school changed from 42 to 46 minute periods:

More	12
Less	3
Same	36

c. Students whose school changed from 57 to 43 minute periods:

More	3
Less	5
Same	13

Frequency of classes

According to the earlier-mentioned survey of the secondary school reports of 161 central schools in the CAP-size categories, most schools have some classes or activities which meet more or less than five periods per week. Physical education, music and health often meet fewer than five times, and agriculture, transcription and laboratory sciences may meet more than five periods per week. In five CAP schools which use floating periods most classes are scheduled four times per week.

Students from three of these five schools were involved in the survey of student opinion (Table X). Only thirteen of the one hundred who replied answered "worse" when asked to compare their floating-period schedules to the former ones in which classes met five times per week. Frequency of class meetings is just one of several items, however, which might have affected these answers. From these same three schools, fifteen teachers thought students are learning "more rapidly" under four longer periods per week than under five short ones (Table XI). In a smaller sampling, nine of 21 students in the school which abandoned the floating-period schedule favored the return to the traditional schedule. Four of the teacher replies from this school indicated that learning proceeds "more rapidly" now that classes meet daily.

TABLE X

Seniors' (100) Reply to the Question
"In General, How Do You Like the Present Schedule When
It Is Compared to the Former One?"

a. Responses of seniors whose classes meet four times per week (formerly met five times per week):

Better	64
Worse	13
Same	19

b. Responses of seniors whose classes meet five times per week (formerly met four times per week):

Better	9
Worse	5
Same	7

TABLE XI

Teachers' (46) Perceptions Related to the Question, "If You Taught under the Previous Schedule Do You Feel that Students Are Learning as Rapidly under This Schedule As under the Old One?"

a. Opinions of teachers whose classes meet four times a week (formerly met five times per week):

More rapidly	15
Less rapidly	0
About the same	21

b. Opinions of teachers whose classes meet five times a week (formerly met four times per week):

More rapidly	4
Less rapidly	1
About the same	5

Table XII shows what teachers think about continuity of learning when classes meet less than five times per week. It is interesting to note that those teachers whose schools are not using the floating-period plan generally believe that continuity would be affected "frequently" or "sometimes," whereas about half of the teachers whose schools are now on such a schedule replied "rarely" or "never" to the same question. Five of the ten teachers (from the latter schools) who answered "frequently" qualified their concern about continuity by limiting its liklihood to slow, junior high or "beginning" (in foreign languages) students.

Period frequency, like most other schedule features, is subject to varying student and teacher perceptions. There are two literature references, however, which recount careful experiments designed to compare the achievement of control groups which studied certain subjects with varying frequency.[1,2] An experiment at Drake

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[1] Donald G. Wallace, "A Comparative Analysis of Achievement in Three and Five Hour Sections of Freshman English," Journal of Educational Research, 49:505-13, March, 1956.

[2] Hugh H. Stewart, A Comparative Study of the Concentration and Regular Plans of Organization in the Senior High School, Contributions

TABLE XII

Teachers' (178) Replies to the Question,
"Is Continuity of Learning Affected When Classes Meet Less Often than Five Times Per Week?"

a. Teachers whose classes meet four times a week:

Frequently	10
Sometimes	18
Rarely	27
Never	5

b. Teachers whose classes meet five times a week:

Frequently	51
Sometimes	50
Rarely	15
Never	2

University found that five weekly periods of freshman English were not superior to three longer periods, and the Mount Vernon (N.Y.) study indicated that achievement in one semester of long periods was superior to that of two semesters of shorter ones.

Five teachers from the floating-period schools suggested that their long periods be retained, but that classes meet five times per week. Perhaps this arrangement would prove superior for most learning endeavors, but the elimination of the floating period introduces more conflicts in the small school's schedule. Here again, however, the use of multiple-classes, particularly in the small-enrollment electives, may eliminate the conflicts which interfere with the achievement of more idealized small school schedules.

Should the frequency of class meetings vary? Present practice indicates that frequency does vary. The different purposes and needs of learning endeavors substantiate the need for even more variation.

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to education No. 600, New York, Bureau of Publications, Teachers College, Columbia University, 1934.

Provision for study

Since the question of homework often triggers the release of adrenalin in partisan respondents, the Study Group would probably be wise to ignore a matter resolved in local communities more by debate than by research results. Homework philosophy and practice should be worked out at the local level by students, parents, board members and staff. Nevertheless, the Study Group would be remiss if the Guidebook did not present an important point of view concerning homework.

It is trite to say that school purposes should determine attitudes toward homework, but this statement gains added significance when four questions from "Research on Homework" are paraphrased.

1. What does homework do for the child?
2. What do pupils do at home if they are not doing homework?
3. Are home study conditions satisfactory?
4. Are the results of home study commensurate with the effort?

Authors of the article add, "Certainly there is no conclusive evidence from achievement test results or other achievement records to justify the persisting faith of many persons in the merits of routine homework."[1]

There may be many desirable undocumented reasons for homework, but they generally do not relate to rote exercises which monopolize the evenings of slow learners, or the "extra" assignments bright youngsters get to keep them busy while the normal youngsters "go free." It would seem reasonable to relate homework to the development of habits and understandings which improve behavior. Why not place the student in the center of cooperative endeavor by the home and school and focus the homework on problems of concern to the home? Such assignments may lead to worthy discussion and shared interests, and proper appraisal by the teacher might lead to the development of independence and critical judgment--the important balancing adjuncts to shared activity. (Could not parents as well as children benefit from shared study and discussion of such matters as family budgets, income taxes, nutrition, health, vacation, travel, recreation, religion, sibling relationships, dating, marriage, parenthood, educational and vocational planning, and observations and self-evaluations of behavior?)

If homework for high school youngsters should be somewhat limited, what study provision should be made during the school day?

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[1] Esther J. Swenson, James C. Cost and Greene Y. Taylor, "Research on Homework," Journal of Education, 137:20-22, March, 1955, p. 22

One teacher remonstrance about the question on study time during class was, "Certainly not! What do you mean 'finished'? They are not allowed to start homework in class except on rare occasions with the consent of the teacher."

Nevertheless, 54 of 85 teachers in schools using six- or seven-period days responded with "most of the time" or "sometimes" to the question, "Do the students have time to finish their assignments in class?" And 35 of the 100 teacher responses from the "short period" schools answered similarly.

TABLE XIII

Do the Students Have Time to Finish Their Assignments in Class?

a. Responses of 85 teachers in schools using six or seven-period days:

Most of the time	17
Some of the time	37
Rarely	25
Never	6

b. Responses of 110 teachers in schools using eight or nine-period days:

Most of the time	6
Some of the time	29
Rarely	53
Never	22

Out of 193 student reactions, there were 158 "sometimes" responses to "Do you feel that enough time for study is provided during the school day?"[1] They want more time, however. When asked for suggestions for schedule improvement, 121 students checked, "Have more supervised study within the classroom." Of particular significance is the fact that students rate the desire for supervised study ahead of the suggestion to "Offer more subjects," which drew 88 replies. Combining the supervised study suggestion with the 52 "Have more study hall periods" replies indicates that students are very anxious to do most of their studying during school hours. It is somewhat strange that they did not relate their most popular suggestion to the need for longer periods. Perhaps the desire to "have their cake and eat it too" is revealed in the relationship of the responses dealing with items one, seven, nine, seventeen and twenty, but the students' most important concerns are clearly depicted in Table XIV.

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[1] See Appendix A, Student Questionnaire, Question A-8.

TABLE XIV

Replies of 193 Seniors in Seven Schools to the Question, "What Suggestions Do You Have for Schedule Improvement?"

Suggestions	I	II	III	IV
1. Make periods longer	12	7	3	22
2. Make periods shorter	7	10	19	36
3. Offer more subjects	23	21	44	88
4. Offer fewer subjects	1	1	3	5
5. Have more time for activities	12	8	31	51
6. Have less time for activities	2	4	2	8
7. Have more study hall periods	8	23	21	52
8. Have fewer study hall periods	3	3	8	14
9. Have more supervised study within the classroom	22	45	54	121
10. Have less supervised study within the classroom	2	1	2	5
11. Have more laboratory time	7	11	16	34
12. Have less laboratory time	1	1	3	5
13. Have more homeroom time	13	13	14	40
14. Have less homeroom time	1	2	2	5
15. Have more shop time	3	6	12	21
16. Have less shop time	0	0	0	0
17. Lengthen the lunch period	22	15	63	100
18. Shorten the lunch period	3	0	0	3
19. Lengthen the school day	5	11	8	24
20. Shorten the school day	11	7	16	34
21. Vary the length of class periods	2	14	4	20
22. Have all class periods the same length	12	10	19	41
23. Have class periods revolve	9	17	34	60
24. Class periods should not revolve	16	26	16	58

I. Students (42) from 3 schools on 8 period day.
II. Students (51) from one school on 7 period day.
III. Students (100) from 3 schools on 6 period day.
IV. Total (193).

Despite the failure of many students to check "Make periods longer"(Table XIV), there is a positive relationship between supervised study and the length of the period. Note the student reactions depicted in Tables XV and XVI.

TABLE XV

Replies of 193 Seniors to the Question,
"Do Your Teachers Generally Set Aside a Part of the Regular
Class Period for Supervised Study?"

a. Students in 57- or 58-minute periods:

Yes	63
No	37

"If 'yes,' are you able to get help on assignments in class?"

Most of the time	27
Sometimes	23
Rarely	6
Never	0
(Omit)	7

b. Students in periods 46 minutes or less in length:

Yes	28
No	65

"If 'Yes,' are you able to get help on assignments in class?"

Most of the time	6
Sometimes	11
Rarely	8
Never	1
(Omit)	2

TABLE XVI

Reactions of 97 Seniors to New Schedules Which Feature 57- or 58-Minute Periods (Old Schedules Used Periods of 45 Minutes)

a. Is there as much time for study under the present schedule as there was under the former schedule?

More	48
Less	22
Same	27

b. How much do you use the library under the present schedule as compared with the old schedule?

More	29
Less	18
Same	50

c. Do you get to know the teachers as well, or better, or not as well under the present schedule as under the former schedule?

Better	22
Not as well	2
No difference	73

In recent years scheduling literature has run contrary to the Conant view by suggesting that floating-period, five- or six-period days are superior to the straight seven- and eight-period days. Proponents claim that the longer periods provide for supervised study and prevent study halls from wasting classroom space and teacher time. Study halls are often valuable to students, but are they generally so when related to the best possible use of school time?

The Study Group believes that the most significant responses of the 193 seniors and 234 teachers who answered the schedule questionnaires emphasize the importance of supervised study, the long class period and the improved use of the long periods for teachers to attend to the personal needs of individuals. Here is a challenge and opportunity for teacher artistry and science to be expressed at its best.

TABLE XVII

Replies of 234 Teachers to the Question,
"Which Best Describes the Characteristics Which You Feel
Are the Advantages and Disadvantages
of Supervised Study?"

a. Advantages	
1. More opportunity to help students	153
2. More opportunity to enrich program for better students	55
3. Better opportunity to become acquainted with students	32
4. More opportunity for special work with slower students	107
5. More opportunity to use library facilities	29
6. More opportunity to help develop better study habits	92
7. More opportunity to use supplementary materials	55
8. Other: More project time	3
Better for field trips	2
Study students	1
b. Disadvantages	
1. Period too long for students' attention span	30
2. Period too short to allow both instruction and study	47
3. Planning of assignments more complicated	12
4. Difficult to make library assignments	17
5. Better students finish lesson too soon	44
6. Other: Teacher cannot stop teaching	5
Discipline cannot wait	1

Floating periods

A floating period has been difined as a period which moves about or occurs at a different time in the schedule from day to day. Five CAP schools use floating periods to replace dropped periods, thereby scheduling most individual classes four times a week rather than five. Four schools work seven periods into five six-period days and one school gets eight periods into five seven-period days. The first four schools have two X periods per week and the fifth school has three. The X periods represent the most successful attempts to date for CAP schools striving for schedule flexibility. Although they are generally scheduled for specific times they can easily be interchanged with other periods if assemblies or other circumstances make it appropriate.

It is clear that most students and teachers in CAP schools which use the floating-period schedule like the relief from the monotony of having the same routine each day. Seventy-three of 100 students in schools which use floating periods "like the idea" (Table XVIII). Those students which have not experienced this type of schedule may be apprehensive about it. Table XIX expresses similar opinions on the part of teachers. Teachers used remarks such as "no period always last," "relief from monotony," and "have all periods float" to endorse the practice.

TABLE XVIII

Seniors (193) Respond to the Question,
"Do You Like the Idea of Classes Changing Their Position
in the Schedule from Day to Day during the Week?"

a. Students whose schools use the floating-period schedule:

Yes	74
No	14
No opinion	13

b. Students from other schools:

Yes	17
No	45
No opinion	31

Four CAP schools which went to floating periods, however, were primarily interested in obtaining longer periods without introducing the extra conflicts small schools experience if they adopt a straight six-period day. Among the schedule patterns now operative in CAP, the floating-period schedules are definitely superior to others if high premium is placed upon longer periods and supervised study. The X periods are not mere by-products of such scheduling. They add to schedule flexibility and facilitate the scheduling of activities.

TABLE XIX

Two Hundred Twenty-Nine Teacher Responses to the Question, "What Is Your Opinion of Schedules in Which Classes Revolve or Change Position in the Schedule from Day to Day during the Week?"

a. Teachers in schools with a floating-period schedule:

Excellent practice	22
Probably good practice	19
Probably a poor practice	7
Definitely a poor practice	4
No opinion	10

b. Teachers in schools without a floating-period schedule:

Excellent practice	8
Probably good practice	46
Probably a poor practice	44
Definitely a poor practice	27
No opinion	42

How many periods should float? This depends upon how restrictions relate to the staff's desire for a revolving schedule. One school floats all periods except one and most teachers and students like the novelty from day to day and the "balancing effect." One period is locked because students from a nearby school engage the shop and the shop teacher that period under a shared-service arrangement. The school which abandoned the floating-period schedule listed "difficulty of using shared service personnel" as one of the reasons. Double periods are more difficult to schedule, but the longer periods diminish the need for some of them. A revolving schedule in the secondary school increases the difficulty of scheduling the physical education, art, music and other "special" teachers in the elementary school. As one guidance counselor said, however, "This is more of a problem of flexible people than of flexible scheduling."

But revolving schedules are no panacea for schedule ills. They have been in use in essentially the forms currently observable for about fifty years. They apparently have not become popular because they are more difficult to plan, and teachers who have not tried them are apprehensive, afraid they will lead to confusion. But as one teacher expressed it, "The students know where to go each period. If we forget, we just ask them and they remind us."

Scheduling the activity program

Without examining the individual schedules of the 161 central schools in the survey of the 1958-1959 Secondary School Report forms, it is difficult to describe them with a high degree of accuracy. Most schools have music and other activities (except athletics) scheduled the same period, but some schools schedule band, chorus and other activities as classes and eliminate the separate activity period. Still others schedule band and chorus as classes and free some periods for other activities.

Table I shows that most schools have one activity period per day if acceptance is granted of the schools' own interpretations of the question, "How many periods a day (exclusive of lunch) are available for student activities (including clubs and assemblies)?"[1] In the smallest of these schools, four additional periods are exclusively set aside for music, but band and chorus share periods with classes in the other three schools. (The smallest school is shown in Table I as having six activity periods per week.) Another school operates similarly on a schedule which utilized a floating period with a seven-period day, and it has three X periods and four for music.

In one of the CAP schools the last period of the seven-period day is used for music, athletics and other activities. Several teachers seemed dissatisfied with the arrangement and one said that competition with athletics had "set the music program back twenty years." Of the seven schools whose students were questioned about scheduling, this is the only one which starts athletic practices before regular dismissal time. (Though the athletes have an extended day in these schools, they are provided with school transportation after practices.) Most schools apparently felt that athletics should be confined to the extended school day because conflicts are reduced and athletics demand more time than they can justifiably be allotted when competing with other activities and regular classes.

Students from all seven schools provided gratifying replies when 82 per cent of them answered "yes" when asked if their present schedule provides enough time for activities.[2] They generally related no clear advantages for activities when one type of schedule was compared with another (Table XX). Apparently, however, the school with the revolving schedule has not yet developed the use of the X periods to the same extent as the other four schools with floating-periods. This was acknowledged by students who wrote that

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[1] Item 5(b) on the New York State Secondary School Report form (1958-1959).

[2] See Appendix A, Student Questionnaire, Question A-13.

TABLE XX

Replies of Seniors to the Question, "Is There Enough Time for Extra-Curricular Activities under the Present Schedule as Compared to the Old One?"

a. From a school which changed from 58-minute periods to 43-minute periods:

More	3
Less	8
Same	9

b. From a school which changed from 42-minute periods to 46-minute periods:

More	23
Less	14
Same	14

c. From three schools which changed from shorter periods to 57- or 58-minute periods:

More	23
Less	29
Same	45

(17 of the "less" replies were from the school with the revolving schedule.)

there are "too many activities in one period," and by teachers who indicated that there were "too many conflicts of activities." Combined replies from two teachers from this school provided this reaction. "Give our schedule time to prove itself. The X periods are not well-planned, but we can work it out."

The philosophy behind any schedule is more important than the design of the time pattern. Excusing students from classes for music lessons would not be such an aggravation if music teachers and others planned together to confine the practice as much as possible to bright students and scheduled most other students during study halls. One guidance counselor said, "We rotate weekly student council meetings from one period to the next. This activity involves only a few students but it is of major importance to our school."

In most schools activities are considered an integral part of the educational program rather than an appendage. This does not mean, however, that activities should dominate the school day or that students should be free from choices which limit their participation to a few activities of greatest interest. More important than conflict-free activity arrangements designed to "let everybody participate in everything" is a conscious attempt to get each student involved in some activity of genuine interest to him. The counselor in one of the larger schools said, "Student choice of activities is a part of maturing ability to make decisions, and the limitations placed upon the participation of some has increased the involvement of the less aggressive students."

It would appear at present that activities in most CAP schools should be scheduled in a separate activity period and that the largest schools may be able to schedule activities successfully in regular class periods or confine the activity time to the X periods of floating-period schedules.

Facilities

One CAP school delayed the adoption of its six-period day until new facilities made added space available. The school which abandoned the six-period day gave "crowded facilities" as one of the reasons for returning to eight periods. Teachers from a school on a seven-period day frequently listed "need more rooms and more teachers" under a request for suggestion for schedule improvement.

The school which returned to eight periods continues to face some crowding problems, according to one teacher, but its current schedule indicates that part of the crowding might be due to the distribution of twenty daily classes with enrollments less than ten students. Unless the classrooms are too small to accommodate multiple-classes, the school's problem may be one of too many small groups rather than inadequate space or too many students.

Facilities may limit scheduling considerably in small high schools if an undue proportion of the space is consumed by specialized rooms or if the enrollment has simply increased beyond the building capacity. Fortunately, no CAP schools are crowded to the extent that they have been forced to use multiple bus runs and double or staggered shifts. Multiple-use space places a small school in an advantageous scheduling position. It is somewhat doubtful if even the larger of the CAP schools could keep science laboratories, special shops, the home economics suites and typing rooms busy all day if they were not used for something other than the specialized functions for which they were primarily designed. Some small schools throughout the country have elaborate science laboratories which are appropriate for two to four lab periods per week and inappropriate for regular classes the rest of the time. Business education rooms are sometimes full of typewriters which are used one or two periods a day and which interfere with the use of the room the rest of the time.

Organizational patterns have generally indicated that a great number of small-group electives can be more easily accomodated by eight periods than by six if facilities are crowded. This will continue to be true unless versatility in facilities and teachers provides more effective use of both in the small high school.

Number of periods

The number of periods to be scheduled each day primarily evolves from joint consideration of period length, period frequency, facilities available, the length of the school day and conflict possibilities. There is a common misconception, however, that teachers are given heavier class loads in eight-period days than in schedules with fewer periods. Table XXI shows that the teachers in CAP schools which use seven-period days spend more time in class each week than other teachers. Multiplication of the number of periods taught by the length of each period further indicates that the teachers using eight-period days spend less time in classes than other teachers, but their study hall load is heavy enough to give them less free time than the teachers using six-period days.

TABLE XXI

Typical Load of the Teachers According to the Number of Periods per Week*

a. Teachers (65) using thirty-period week (six-period day):	
Number of classes taught	6
Number of periods in classes	24
Number of periods in study hall	2
Number of free periods	4
b. Teachers (35) using 35-period week (seven-period day):	
Number of classes taught	6
Number of periods in classes	30
Number of periods in study hall	2
Number of free periods	3
c. Teachers (104) using forty-period week (eight-period day):	
Number of classes taught	5 or 6
Number of periods in classes	25 or 30
Number of periods in study hall	10 or 5
Number of free periods	5

*Periods are usually 57 or 58 minutes in six-period day, fifty minutes in seven-period day, and 42 minutes in eight-period day.

If facilities and staff permit it, as many courses can be offered in a six-period day as in one of seven or eight periods. But a straight six-period schedule has more conflicts than one of seven periods, and the latter schedule is more conflict-ridden than an eight-period day. (The differences are reduced if the seven- and eight-period schedules use a separate activity period and the six-period day does not include one.) Thus two of the considerations mentioned above, length of the periods and conflict probabilities, emerge as salient opposing factors in deciding on the number of daily periods unless the floating period is used as a compromise device. For example, a week of six-period days and a floating period involves fewer conflicts than a straight seven-period day--the use of the X periods makes the difference.

Length of school day, week and year

The length of the school day is apparently determined more by the number of daylight hours in mid-winter than by other factors. The darkness of early winter mornings and late afternoons may make school transportation hazardous, especially when snow-packed or icy roads are not uncommon. The Study Group does not suggest that the school day be extended during the period from mid-November through January, but it is appropriate to ask, "What about the rest of the school year?" School transportation would not be more hazardous if the school day were extended to 3:45 or 4:00 P.M. on days with adequate amounts of daylight.

This would allow the length of the periods to be expanded, or it might allow an extra period to be added to the schedule. Varying the length of the school day during the year suggests not only changes in scheduling, but also in the organization of classroom activities and homework practices. Some high schools in Iowa operate from 8:30 A.M. to 4:30 P.M. in an effort to have long periods, and all activities, including athletics, are scheduled during the school day.[1] Double bus runs are made to fit the shorter school day of the elementary youngsters. CAP schools have reduced the need for including athletics in the school day by providing transportation after practices.

While the Study Group is not suggesting the adoption of a greatly extended school day for CAP schools, it is necessary to be consistent with the idea that a schedule exists to facilitate realization of the school's purposes. If the school needs more time, it is available on Saturdays and during the summer as well as in the longer school day.

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[1] From conversation with representative of Iowa State Department of Public Instruction.

Selected students currently travel to Oneonta on Saturdays to participate in the talented youth programs available in science, mathematics and the humanities. This is a commendable practice, but it prompts the reminder that the appropriate difference between the educational programs of the academically talented and the programs of youth with other gifts may not be in the amount of opportunity as much as in the other characteristics of the opportunity. Should opportunities for voluntary enrichment experiences be limited to the bright students? What are the possibilities for local "Saturday supplements" to the daily school program?

There has been considerable post-war attention in educational literature to schools which use the summer months for recreation programs, driver education, art, music, enrichment and remedial courses. Although the Study Group could find no instance of a public school actually adopting a "four quarter" plan whereby school would be in regular session during the summer months, there are several accounts of schools which keep their teachers employed most of the time during the summer to work on program improvement.[1]

The question of length of the school day, week and year is appropriately placed toward the end of the priority considerations about scheduling. Except for the important element of transportation safety, a school's decision on this question should depend upon its answers to the preceding eight questions.

Schedule variability

Inasmuch as Chapter III is devoted to schedule design and implementation which enhance variability, extended discussion of this schedule characteristic is inappropriate in this section. Nevertheless, variability in time patterns becomes an important priority consideration when it is assumed that learning activities are not necessarily best adapted to an uninterrupted series of highly compartmentalized school days.

Are several half-hour periods for typing better than fewer hour-long periods? Should behind-the-wheel instruction in driver education be the same duration as periods of class instruction? Is it necessary to have double periods for shorthand transcription if hour periods are used? Can individual music lessons be effective if confined to twenty or twenty-five minutes? How often are double or triple periods needed for laboratory and vocational endeavors if single periods are from fifty-five to ninety minutes in length?

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[1] J. Dan Hull and Grace S. Wright, "The All-Year School: A Bibliography," U.S. Office of Education, Circular No. 470, Washington, D.C., Government Printing Office, March, 1956.

The implications for variation in period length and frequency are not limited to the nature of learning activities. They also relate to the capabilities and interests of the learner. One boy may be able to master algebra in ten weeks. Should he be required to attend algebra class for the entire period? Every day? For the entire year? Would it be reasonable for a boy who is planning a career as a television technician to spend extra time in the physics laboratory?

Except for double-period classes, no variation in period length is built into the design of CAP schedules. However, 39 teachers reported that they could extend the length of a period occasionally.[1] When asked how this is arranged the most frequent replies were "arrange with other teachers," "arrange with principal," "use activity period," or "use study hall." For small high schools, this improvisation may have a great deal more promise than designed variations.

Although 68 per cent of the 234 teachers polled indicated they believe it important to balance schedule time for academic classes, this would seem a reasonably obvious concession to the demands of the Carnegie Unit, the Regents Examination, and/or the inability to work out agreements on how course times should differ and how satisfactory schedules could be designed.[2] Twenty-six of the 39 teachers who reported that they have opportunity to extend class periods indicate that they do not sacrifice periods in order to compensate for occasional long periods. When asked, "How does the idea of flexibility in schedule design and implementation appeal to you?" 129 teachers responded "favorably."[3] Most teachers had no suggestion to offer for increasing the flexibility of master schedules.[4] Seven teachers wrote "have more supervised study" and/or "longer periods." Among the other replies and the numbers of teachers responding were "hire more teachers" (5), "more periods" (4), "ability grouping" (4), and "double periods at times" and/or "sacrifice periods at times" (3).

It has often been the practice in many small schools to excuse students from classes occasionally for participation in dramatics, music, athletics, student council and other activities. Evidence of such practice in some CAP schools is provided by the disapproval of a few teachers who wrote such comments as "too much flexibility," "classes interrupted," "reduce club activities," "don't excuse students from classes" and "have activities after school" when they were asked for suggestions for schedule improvement. There were isolated comments, however, which recognized that the traditional "class" concept of scheduling is often an unfortunate restriction upon students" programs--"eliminate time requirement for Regents," "allow bright students to skip some regular classes to audit others," modify the plan in Education Unlimited" and "vary period length."[1] One multiple-class teacher who teaches eight sections of foreign languages in four periods replied that she would prefer sixty-minute periods to those of fifty minutes, she would occasionally like to extend the length of a class period, she did not think it important to balance class time, and she offered this criticism of a schedule she generally likes.

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[1] Appendix B, Teacher Questionnaire, Question No. 38.

[2] *Ibid.*, Question No. 41.   [3] *Ibid.*, Question No. 42.

[4] *Ibid.*, Question No. 43.

"There is no provision for talented youth to have a voice in budgeting time in blocks, for I think that over a semester, these students may wish to pursue some activity or investigation without being interrupted by the bell."

Here is a teacher with good insight into the value of long periods and the value of flexibility in scheduling.

Dilemma and Challenge

Schedule designers in small schools, particularly, cannot escape dilemma in the context of traditional practices. Thus the judgments associated with the priorities discussed in this chapter are of crucial importance. The floating-period schedule goes part of the way necessary to reduce the opposition of long periods to conflict probabilities, but it can never go beyond the limitations associated with the traditional patterns for organizing learning activities. The learning value associated with smallness--the opportunity for teachers to better understand and help change the private mental world of individual students--cannot be effectively reconciled with the need for a greater variety of educational experiences and longer periods if each cubicle of the master schedule is restricted to one teacher and one class.

The proponents of comprehensiveness recognize that an educational opportunity relatively uninteresting and obscure as far as most pupils in a small high school are concerned may be just the thing to attract and hold the student who has found little to his liking in the rest of his program. The proponents of longer periods than those customarily found in small high schools believe increased interaction between the teacher and student enhances the sparking of student curiosity and the development of self-directed learning. The advocates of flexibility make the obvious suggestion that variation in the length and frequency of schedule periods will help make time the servant of learning activities rather than their master.

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[1] Rotating schedule. See Chapter III.

CHAPTER III

SCHEDULE DESIGN AND IMPLEMENTATION

Although the Committee of Ten made recommendations in 1893 which had significant influence upon the organization of American secondary schools, it was not until they were amplified in 1909 through Pritchett's report to the Carnegie Foundation for the Advancement of Teaching that high schools fell into a schedule lockstep.[1] Schedule designers had no choice but to capitulate to the Carnegie Unit after 1909 because colleges established it as a basis for entrance requirements. They "agreed" to do so because the Carnegie Foundation defined colleges in terms of entrance requirements when it created a retirement fund for college professors. The Carnegie Unit became popular because it was subsidized. It promoted the idea that time should control learning experience. The forty-to sixty-minute period, four to five times per week became a standard of school organization and the universality of the practice has convinced most teachers and administrators that it must be the "right way."

Organization was simplified because lockstep in time led to lockstep in grouping and in teaching practices. It helped provide an orderly day in which the teaching profession felt secure. Learning experiences were adjusted to the demands of the organization.

The Study Group on Flexible Scheduling finds it easy to be critical of the Carnegie Unit, easy to resent its restrictions of schedule experimentation over the years. The deprecations, however, cannot be justified upon the basis that another pattern of organization has proven superior. Now that its grip has loosened because of changing college admissions practices and enlightened attitudes of some state departments of education, it must be admitted that substantial departure from some semblance of traditional scheduling may not be practical for some time--not until multiple-classes, technology and school aides find acceptance with a complete staff rather than with isolated teachers.

Most of the examples of basic schedule design which are depicted in this chapter have been taken from the literature and from some of the CAP schools; they do not generally represent disregard of the Carnegie Unit. The purpose of the chapter, however, is to show the designs and indicate how they may be implemented in order that time may be better used to accommodate learning. The Study Group is aware that the possibilities for schedule variations are limitless. They have not been, nor will they be, exhausted in practice. The variations of schedule patterns and use suggested herein merely scratch the surface of possibilities, but perhaps they may stimulate schedule designers to try their own improvisations.

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[1] Ellsworth Tompkins and Walter H. Gaumnitz, The Carnegie Unit: Its Origin, Status, and Trends, U. S. Office of Education, Bulletin 1954, No. 7, Washington, D. C., Government Printing Office, 1954.

The Study Group originally considered relating school philosophy to the various patterns shown, but the development of the preceding chapter on priorities makes this somewhat superfluous. The notations which accompany some of the examples may not agree with some reader opinions--there is ready admission that opinions on these characteristics are debatable--one school's like is another's dislike.

Six-Period Schedule in a Five-Period Day

The first example is taken from an experiment conducted at East Hampton (Connecticut) High School in the school years 1949-50 and 1950-51.[1] This schedule which utilizes a five-period day simplifies the illustration of rotation and the floating period. Rotation, as it is narrowly construed in the Guidebook, refers to a schedule which in part or in its entirety may be rotated ninety degrees to change it from a horizontal to vertical (or vice versa) distribution of classes. The idea need not be confined to the five-period day.

A straight five-period day used for five days has a symmetrical design. It is assumed that there would be three morning periods and two in the afternoon. The lunch period is omitted from the designs shown.

Horizontal

M	T	W	Th	F
1	1	1	1	1
2	2	2	2	2
3	3	3	3	3
4	4	4	4	4
5	5	5	5	5

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[1] Grace S. Wright, Walter H. Gaumnitz and Everett A. McDonald, Jr., Education Unlimited: A Community School in Action, U.S. Office of Education, Bulletin 1951, No. 5, Washington, D.C., Government Printing Office, 1951.

If the schedule were rotated, or turned ninety degrees to the left in order that it would "stand on end," it would then distribute classes vertically.

Vertical

M	T	W	Th	F
1	2	3	4	5
1	2	3	4	5
1	2	3	4	5
1	2	3	4	5
1	2	3	4	5

If a school wished to continue the five=period day, but have a six-period schedule, the East Hampton design would be simulated. Each period would be scheduled four times per week instead of five. A sixth period, or floating period, would replace the dropped periods. This period could be used for four classes of one course and an X period, or it could be used for two courses such as typing and physical education.

Horizontal

M	T	W	Th	F
1	1	1	1	6
2	2	2	6	2
3	3	X	3	3
4	6	4	4	4
6	5	5	5	5

Vertical

M	T	W	Th	F
6	2	3	4	5
1	6	3	4	5
1	2	X	4	5
1	2	3	6	5
1	2	3	4	6

How would this look when applied to a student program? The following example is provided by East Hampton for Mary Smith. Instead of using the X period for activities, she uses it for a typing class. Her program is as follows:

First period	English II	Fourth period	Biology
Second period	Latin II	Fifth period	World History
Third period	Geometry	Sixth period	Typing, Physical Education

Horizontal Schedule for Mary Smith's Classes

Monday	Tuesday	Wednesday	Thursday	Friday
Eng. II	Eng. II	Eng. II	Eng. II	Typing
Lat. II	Lat. II	Lat. II	Phys. Ed.	Lat. II
Geom.	Geom.	Typing	Geom.	Geom.
Biology	Phys. Ed.	Biology	Biology	Biology
Typing	W. Hist.	W. Hist.	W. Hist.	W. Hist.

Vertical Schedule for Mary Smith's Classes

Monday	Tuesday	Wednesday	Thursday	Friday
Typing	Lat. II	Geometry	Biology	W. Hist.
Eng. II	Phys. Ed.	Geometry	Biology	W. Hist.
Eng. II	Lat. II	Typing	Biology	W. Hist.
Eng. II	Lat. II	Geometry	Phys. Ed.	W. Hist.
Eng. II	Lat. II	Geometry	Biology	Typing

The rotations could be used for an entire week as shown above, or they could be used on some occasions for just one day per week. In such instances, the first period would last four periods on Monday, be scheduled the usual time on Tuesday, Wednesday and Thursday and the regularly scheduled floating period would replace it on Friday. In the second week the schedule could be rotated to the vertical position only on Tuesday when the second period would occupy most of the school day; the rest of the week the horizontal schedule would be in use.

Combination
(Schedule is vertical
on Monday, horizontal
the rest of the week.)

M	T	W	Th	F
6	1	1	1	6
1	2	2	6	2
1	3	X	3	3
1	6	4	4	4
1	5	5	5	5

Combination
(Schedule is vertical
on Tuesday, horizontal
the rest of the week.)

M	T	W	Th	F
1	2	1	1	6
2	6	2	6	2
3	2	X	3	3
4	2	44	4	4
6	2	5	5	5

Such an arrangement could continue through a five-week cycle until the five regular periods had each extended throughout one day, or it could be followed for one more week and the floating period could be similarly extended. If the latter plan were followed the floating period would not interrupt the other periods when the schedule was vertically oriented. A school could then use one cycle in which the rotation could be frozen for a week on the vertical schedule for Monday, the second week it could be frozen on Tuesday's vertical schedule, and this could be continued to obtain a modified concentration plan for six weeks. Each period except the X period would have been extended for one full week.

The following report came from East Hampton relative to the rotation for one day at a time.

> The advantages of this plan have now been demonstrated in many ways. The biology teacher is able to make an all-day field trip into the woods or to a nearby museum WITHOUT INTERRUPTING THE PROGRAM of any other teacher or any of the pupils. The English teacher can plan with his class to read an entire play, discuss it, plan for and carry out its production without the usual fits and starts. In that single day a class in drama can go to see a play in a nearby city without waiting for the weekend or without disrupting other class projects or the progress of classes involved in two or more activities. The mathematics teacher can take his class out on the playground, up to the lake, or into the woods actually to perform a surveying or other life-related operation. . . .
>
> In the industrial arts shop or the graphic arts room, students may now learn to work as they would

> under regular factory methods . . . Business groups now have the opportunity to more nearly reproduce business practices . . . physical education teacher may expand his program . . . to include golf, camping, hiking, skiing . . . .[1]

The Study Group has learned that the rotating schedule at East Hampton was dropped in the early 1950's because large increases in enrollment created a very crowded situation and the school had to retreat to shorter periods and more of them.[2] That the five-period day has merit, however, is indicated by the literature accounts of adoptions in New Mexico, Indiana, Massachusetts, Oregon and Wisconsin.[3-7] There are no indications that the rotations are being used, but schools report that teachers and students prefer the longer periods, the increased individualization in instruction and the reduced number of study halls.

Seven-Period Schedule in a Six-Period Day

Four CAP schools have adapted the floating period to the six-period day. This provides seven 57 - or 58-minute periods, each scheduled four times per week, and two X periods for activities.

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[1] Grace S. Wright, Walter H. Gaumnitz and Everett A. McDonald, Jr., Education Unlimited: A Community School in Action, U.S. Office of Education, Bulletin 1951, No. 5, Washington, D. C., Government Printing Office, 1951, p. 23-24.

[2] Conversation with Dr. David B. Austin, Professor of Education, Teachers College, Columbia University, September, 1958.

[3] Archie McDowell, "The Santa Cruz Schedule," Bulletin of the National Association of Secondary School Principals, 42:75-75, March, 1958.

[4] Edmund Ford, "The Diagonal Meets at 2:20 Today," The Teachers College Journal, 28:64-67, March, 1957.

[5] A. Russell Mack, "The 'Rotating' Schedule," The Bulletin of the National Association of Secondary School Principals, 31:25-30, November, 1947.

[6] Floyd E. Wiegan and Norman Dorschner, "Educational Opportunities with the Class-Study Period," The Bulletin of the National Association of Secondary School Principals, 38:84-89, October, 1954.

[7] Ray L. Talbert, "Scheduling Activities for a Small High School," Oregon Education, May, 1958, p. 20-21.

Three of the time patterns may be illustrated by the following design. The lunch period is not shown. One school used a "split" lunch period, the others used one 45-minute period.

Sample CAP Pattern

M	T	W	Th	F
1	1	1	1	X
2	2	2	7	2
3	3	7	3	3
4	7	4	4	4
7	5	5	5	5
6	X	6	6	6

One school clears the floating period for band and chorus, but the music period is shared with classes in the two larger schools. A fourth school also schedules band and chorus as a class, but it modifies the time pattern in providing CAP's most unique schedule. In order to balance "optimum-minimum" learning times, the pattern shown above was adapted to a revolving schedule in which all periods except the fourth float. The fourth period is locked because of a shared-service arrangement with another school. Clock time is shown with this example in order to illustrate the milk break. The junior high school youngsters are at lunch from 11:50 to 12:10, the high school youth from 12:50 to 1:10.

Revolving CAP Schedule

	M	T	W	Th	F	
8:45-9:43	1	6	5	3	1	
9:45-10:43	2	7	6	5	2	
10:43-10:50	milk break					
10:50-11:45	3	1	7	6	3	
11:50- 1:10	4	4	4	4	5	(20 minute split lunch period)
1:12 -2:10	5	2	1	7	6	
2:12 -3:10	X	3	2	X	7	

The X periods provide many possibilities for schedule variation in the secondary school if the changes can be accommodated by the elementary school which also uses the art, music and physical education teachers. Variability may be accomplished in either of two ways. In the following pattern note how the revolving schedule is changed when the X period is inserted on Tuesday and Wednesday to double the length of period number one and provide for a special assembly. The X period is inserted between periods seven and one on Tuesday, thus moving period six to Monday afternoon and seven moves into the spot usually occupied by six. On Wednesday afternoon the X period is inserted in one's usual place, and periods one through seven on Wednesday and Thursday are moved ahead one period, maintaining their relative positions in the schedule. In these shifts the regular continuity of class schedules is not destroyed.

X Period Shifted

M	T	W	Th	F
1	7	5	2	1
2	X	6	3	2
3	1	7	5	3
4	4	4	4	5
5	2	X	6	6
6	3	1	7	7

Contrasted with the preceding method of obtaining a double period and moving the time for an assembly is the one below. This one represents a direct interchange of the X periods with periods seven and one. Schedule continuity is not preserved, yet change by this method is simpler than the previous one because only four periods must be shifted, and it is easier to correlate changes in the high school and elementary schedules. CAP schools use this method for obtaining schedule flexibility

X Period Interchanged

M	T	W	Th	F
1	6	5	3	1
2	X	6	5	2
3	1	7	6	3
4	4	4	4	4
5	2	X	7	6
7	3	2	1	7

Schedules Designed for a Seven-Period Day

Four CAP schools use seven-period schedules and one school uses a floating period to get an eighth period worked into the seven-period day. Three of the four schools on the seven-period stereotype have fifty-minute periods and one school uses 46-minute periods. Each of the eight fifty-minute periods utilized in the fifth school is scheduled four times per week, and there are three X periods.

Straight Seven-Period Schedule

	M	T	W	Th	F
8:45- 9:35	1	1	1	1	1
9:40 -10:30	2	2	2	2	2
10:35 -11:25	3	3	3	3	3
11:30- 12:20	4	4	4	4	4
12:20- 12:45		LUNCH			
12:45- 1:35	5	5	5	5	5
1:40 - 2:30	6	6	6	6	6
2:35 - 3:25	7	7	7	7	7

In the above schedule, the seventh period is usually cleared for activities. None of the schools which use this schedule also use rotation and/or revolving periods. The following example, however, shows that any pattern can be altered occasionally if there is just reason for it. The changes are modifications of the preceding schedule.

Rotating Periods (1, 2, 3,) and
Revolving Periods (5, 5, 7)

	M	T	W	Th	F
8:45- 9:35	1	2	3	1	1
9:40-10:30	1	2	3	2	2
10:35-11:25	1	2	3	3	3
11:30-12:20	4	4	4	4	4
12:20-12:45		LUNCH			
12:45- 1:35	5	6	7	5	6
1:40- 2:30	6	7	5	6	7
2:35- 3:25	7	5	6	7	5

The school which uses a floating period clears it four days each week for band and chorus. Other activities are scheduled in the three X periods.

Floating Period

	M	T	W	Th	F
8:50-9:40	X	1	1	1	1
9:42-10:32	8	2	2	2	2
10:34-11:24	3	8	3	3	3
11:26-12:16	4	4	8	4	4
12:16-12:45	LUNCH				
12:45- 1:36	5	5	5	8	5
1:38 - 2:28	6	6	6	6	X
2:30 - 3:20	7	7	7	7	X

The Monday X period in the above schedule is for homeroom. The first X period on Friday is committed only for school publications and health classes, thus it may be used often for review classes or moved about in the schedule to obtain double periods occasionally. The last period of the week is for activities other than music or publications.

Among the schedule examples discussed thus far, the Study Group feels that the seven-period schedule in a six-period day has more advantages then the other schedules in use in CAP schools. The eight-period schedule just portrayed may be superior, but the fifty-minute period is not as good as 57 or 58 minutes for increasing the use of supervised study and giving more attention to the needs of individuals and small groups. Perhaps some modification of this schedule might combine most of the advantages of both schedules. The following examples of seven-period days strive to match the longer periods of the six-period days except for the activity period, which is shortened to forty minutes. Adoption of any of these examples would mean that the school day must be extended.

Longer Class Period, Shorter Activity Period

	M	T	W	Th	F	
8:40- 9:37	X	1	1	1	1	
9:40-10:37	2	2	2	7	2	
10:40-11:37	3	3	7	3	3	
11:40- 1:02	4	7	4	4	4	(25-minute lunch period)
1:05- 2:02	7	5	5	5	5	
2:05- 3:02	6	6	6	X	6	
3:05- 3:45	A	A	A	A	A	

The Monday X period in the above example could be used for homeroom, the last period each day for music, and the X period on Thursday for other activities.

The following is a similar example in which the periods revolve and the activity period is combined with the lunch period.

Revolving Class Periods, Short Activity Period

	M	T	W	Th	F	
8:40- 9:37	X	6	5	4	2	
9:40-10:37	1	7	6	5	3	
10:40-11:37	2	1	7	6	4	
11:40-12:45	A	A	A	A	A	(25-minute lunch period)
12:48- 1:45	3	2	1	7	5	
1:48- 2:45	4	3	2	1	6	
2:48- 3:45	5	4	3	X	7	

The next sample is modified to eliminate the homeroom period on Monday morning, confine all activities to the activity period at noon, and provide for a teachers' meeting on Thursday afternoon. Periods would begin and end with the clock times shown on the preceding example.

X Period Shifted

M	T	W	Th	F
1	7	6	5	2
2	1	7	6	3
3	2	1	7	4
A	A	A	A	A
4	3	2	1	5
5	4	3	X	6
6	5	4	X	7

The final suggestion for modification of the above pattern would eliminate the X periods entirely, start school Monday morning at 9:40 and dismiss Friday afternoon at 2:45.

The Eight- and Nine-Period Day

Table I indicated that thirteen of the 22 CAP schools, like 126 of 139 other central schools of similar size, use eight or more periods in each school day. Despite the Study Group's inclination to favor a six- or seven-period day, this popular and traditional schedule conforms to Conant's current schedule suggestions and it has undeniable advantages--particularly, for small schools whose staffs feel that they are not ready to use multiple-classes, and they feel that the premium on avoiding conflicts in electives is higher than that on supervised study.

Were it not for the presence of extra study halls in the eight- and nine-period days, rotations and other shifts could more easily be made to help overcome the handicap of short classes. Those students who take five courses may especially benefit from schedule variation. Such a schedule for Bill Jones, a college-bound senior who is taking five "solids," would appear in the typical schedule as follows:

Typical Eight-Period Schedule

	M	T	W	Th	F
8:45- 9:27	Advanced Algebra				
9:30-10:12	Physics				
10:15-10:57	Gym	Lab	Gym	Lab	Gym
11:00-11:42	Spanish				
11:45-12:25	Lunch				
12:28- 1:10	Study Hall				
1:13- 1:55	English IV				
1:58- 2:40	Problems of Democracy				
2:43- 3:25	Activities				

Note the schedule differences which result from switching four morning periods and rotating two in the afternoon. Advanced algebra, Spanish and gym each have one double period, physics has the usual double period on Tuesday, plus a triple period on Thursday. The rotations of periods six and seven in the afternoon provide a double period for each.

Modified Eight-Period Schedule

	M	T	W	Th	F
8:45- 9:27	Advanced Alg.	Advanced Alg.	Advanced Alg.	Physics	Adv. Alg.
9:30-10:12	Advanced Alg.	Physics	Physics	Physics	Physics
10:15-10:57	Gym	Physics	Gym	Physics	Spanish
11:00-11:42	Spanish	Spanish	Gym	Spanish	Spanish
11:45-12:25	LUNCH				
12:28- 1:10	Study Hall				
1:13- 1:55	Eng. IV	Problems of Democracy	English IV	English IV	English IV
1:58- 2:40	Eng. IV	Problems of Democracy	Problems of Democracy	Problems of Democracy	Problems of Democracy
2:43- 3:25	Activities				

Although none of the CAP schools employ changes similar to those shown, one school which uses an eight-period day interchanges periods every two weeks in order to avoid having the same period monopolize the particular advantages or disadvantages of a given clock time. The regular order of periods alternates bi-weekly with this sequence: 3, 4, 1, 2, lunch, 7, 8, 5, 6.

The importance of rotations can hardly be overemphasized with respect to a short-period schedule, because they not only make longer periods available, they can often be planned by pairs of teachers who have the same groups of students in consecutive periods or else the teachers' free periods become part of the rotation. Such arrangements give teachers flexibility in programming because they do not require that the schedule for other teachers and other students be changed.

The class assignments for four of Bill Jones' teachers are such that the modification of his schedule in periods one, two, six and seven do not require shifts or rotations for the entire staff and student body.

Class Assignments

Mathematics teacher	Period	Science teacher
Advanced Algebra	One	Free
Free	Two	Physics
English teacher		Social studies teacher
English IV	Six	American History (Citizenship Educa. III)
English III	Seven	Problems of Democracy (Citizenship Educa. IV)

The above scheduling of teachers presumes that Bill Jones' school has agreed that the four classes assigned to the two teachers in periods six and seven are part of the general education program of the school, that the four classes involve just two groups of students. Such assignments are similar to those used in some team teaching arrangements. In addition to allowing the rotations suggested the teachers could combine their English and social studies classes whenever they wish, if facilities were appropriate.

Schedule variations would be worked out similarly for nine-period days. However, the extra study hall becomes an acute problem at times because a student might be on one end of a rotation which would give him three consecutive study halls--hardly an inspiring prospect.

The Concentration, or Single-Subject Plan

Kiskiminetas Springs School for Boys, at Saltsburg, Pennsylvania adapted the schedule ideas of Hiram College to the secondary level.[1] In 1944 the private school abandoned a traditional schedule and began concentrating on one subject at a time for each student. In 1949 the schedule was hailed by J. D. Ratcliff in the Reader's Digest, as the utopia for school organization. He claimed that boys "studied harder, absorbed more, when fed education in concentrated doses."[2]

In 1957, however, the schedule was abandoned as John Pidgeon, the new headmaster, assumed his duties. Mr. Pidgeon did not answer a written inquiry concerning the concentration plan, but when contacted by phone, April 27, 1959, he explained that the schedule was dropped because it "appeared too remedial," the boys were seeing "too much of one teacher too often," and the 22 member staff questioned the retention the boys displayed on the College Entrance Examination and voted unanimously for a return to a conventional schedule.

For thirteen years at Kiski, each year was split into four quarters in which each student was concerned with one subject. ". . . those who worked hard and paid attention would finish the day at 3 P.M. with no homework to do."[3]

Sports and hobbies followed in the late afternoon or evening at this residence school. Ratcliff wrote, "A boy taking Latin would recite in alternate periods. In between recitations he would spend an hour in study hall preparing for the next classroom session."[4]

It would appear that Kiski had a flexible schedule, but did not adapt flexible learning activities to it. It is difficult to appraise the schedule because of the varying reports of the Reader's Digest and the present headmaster. However, if one's purpose were to reduce drop-outs and to pass the College Entrance Examination, the schedule apparently had great merit. (One wonders, however, why the Latin students did not quit school.) If the purpose were to place very high on the Examination, the schedule was, in the opinion of the staff, unsuccessful. Perhaps it is significant that one of the trustees who aggressively opposed the plan in 1957 is a college admissions officer at an engineering school.

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[1] Kenneth Irving Brown, A Campus Decade: The Hiram Study Plan of Intensive Courses, Chicago, University of Chicago Press, 1940.

[2] J. D. Ratcliff, "One 'R at a Time," Reader's Digest, 54:53, March, 1949.

[3] Ibid.

[4] Loc. cit.

Samuel M. Holton provided the following arguments in favor of the concentration plan for the public high school.[1]

1. The possibility of having life-like experiences in the curriculum would be increased.

2. Students react to one master instead of five or six. Competition for his time and energy is reduced.

3. Learning ceases to be a race with the clock.

4. The teacher's attention is focused on fewer students and the amount of record-keeping is reduced.

5. The student's attention is focused on one learning endeavor. He plans for one situation rather than five or six.

6. It is easier to share teachers in small schools.

Dr. W. P. Anderson, former principal of the only public school known to have used the concentration plan in recent years, has indicated that Holton's arguments seemed to be generally true when the plan was used at Mangum High School, Bahama, North Carolina in 1950-1951 and 1951-1952.[2] The "one-subject-at-a-time" plan was organized into five seven-week periods. The schedule's greatest value related to the changed methods in teaching which accompanied it. Teachers began to use supervised study, foster individual projects and utilize field trips. Dr. Anderson pointed out that there was only one dissenting vote among his students at the end of 1950-1951 concerning the desire to continue the plan. Its popularity may have related to the small amount of homework involved. Dr. Anderson said, "The schedule had many advantages, but was discontinued in the fall of 1952 because of the transfer problem. Students moving in or out found considerable difficulty in getting their programs and credits properly adjusted."

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[1] Samuel M. Holton, "Flexibility in Secondary Schools through the One-Subject Plan," High School Journal, 32:113-122, May, 1949.

[2] Interview April 27, 1959. (Professor Anderson is currently on the staff at Teachers College, Columbia University.)

Combination of Concentration and Conventional Scheduling

In a few short pages the Guidebook has gone from a discussion of the short-period compartmentalized day to brief insight into the concentration plan. One extreme represents the small high school's futile effort to imitate the "Conant-style" specialization of the large high school, and the other extreme represents a schedule which conceivably allows the ultimate in teacher creativity in working with individuals and small groups in some subject-matter areas. But the concentration plan is inappropriate for all subject-matter areas. (How many field trips can be appropriately worked into seven or eight weeks of Latin, algebra, typing, etc.?) The schedule overtaxed some of the teachers, its fatigue effect upon some students, though conjectural, may be a handicap, and it contained practical difficulties relative to national standards of organization and operation.

A combination of the two schedule extremes was utilized by a small sixty-pupil high school in Rockland, Idaho for at least four years after its inauguration in 1950. Students at Rockland worked on a single subject for three hours in the morning for twelve weeks --three morning subjects per year. The afternoon was divided into four conventional periods of 42 minutes each. Superintendent T. H. Bell ascribed several advantages to the plan.[1]

1. Students preferred that "solids" be offered in the long period rather than in the short periods formerly used.

2. The number of students who failed the College Entrance Examination decreased.

3. Teachers reported they could cover more material more effectively.

4. There was a decrease in serious student adjustment problems.

5. There was marked decrease in daily absences.

6. The problem of drop-outs was almost non-existent.

According to H. Main Shoun, State High School Supervisor in Idaho, the schedule was abandoned when Mr. Bell moved to another position in 1954 or 1955. Mr. Shoun wrote, "I think it will suffice to say that the philosophy back of his (Bell's) schedule was quite sound for pupils who have strong abilities and who have the interest in the subject to settle down and intensify their efforts until the work is completed. In fact it seems that Mr. Bell was considerably ahead of the times, and that his philosophy on this problem more nearly matches the trends of the present times where it is felt that pupils with outstanding abilities should be allowed to move forward in school subjects at a rate commensurate with their abilities to achieve."[1]

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[1] Maurice L. Hartung, "A Modified Schedule in a Small High School," School Review, 61:516-17, December, 1953.

The Study Group does not suggest that the Rockland schedule is the answer to CAP schedule problems. It continues to be strongly oriented along discrete subject-matter lines and it would involve a limited program. Within this context, however, it could be organized to represent program improvement. The scheduling of one activity period and one study hall in the afternoon would necessitate very little homework and yet each student would be taking five subjects per year. Further merit is addressed to this schedule because of its compromise characteristics. It might represent a good first step for a school which wishes to try long periods without complete abandonment of tradition.

If the schedule strived to orient general education to the morning period and utilized rotations and multiple-calsses in the afternoon for electives, its adoption could be a milestone in the operation of small high schools. Fictional Helen Brown, a senior, would have a schedule like this.

Helen Brown's Schedule

	M	T	W	Th	F
8:45-11:45	First 12 weeks: English IV Second 12 weeks: Government and Economics Third 12 weeks: Home and Family Life (First 3 weeks in June for Regents Review)				
11:48-12:33	Activities				
12:36- 1:06	LUNCH				
1:09- 1:54	Study Hall	Gym	Study Hall	Gym	Home Economics
1:57- 2:42		Home Economics		Off. Prac	
2:45- 3:30	Off Prac.		Office Practice		

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[1] Letter dated November 6, 1958.

The above schedule would take on the characteristics of the schedule recommendations in A Curriculum for Modern Living if the following changes were made:[1]

1. A period of two and one-half to three hours in the morning would fuse the illustrated offerings and portions of other subjects into a general education program which would continue throughout the year.

2. A period just before lunch would be devoted to physical education, health and recreation.

3. The afternoon would be a single two-hour period for the, ". . . individual needs growing out of cultural or intellectual interests, personal strengths and shortcomings, or one's specific vocational plans."[2]

The long morning sessions would feature the language arts and social studies with teachers from other areas brought in as consultants for special problems and interests. These specialists would devote full time in the afternoon to conducting specialized programs in such fields as art, science, industrial arts, agriculture, business education, music, mathematics, homemaking, work experience and foreign languages. In a small school which does not have enough English and social studies teachers to handle all the general education periods, some of the teachers in science, mathematics, or other fields could become generalists. Suggested teacher assignments for the morning might find the English teacher with the ninth grade, the science teacher with the tenth grade, the math teacher with the juniors, and the social studies teacher with the seniors. All other teachers would be "on call" to consult with students and teachers in this morning session.

Such an organization for a small school would be especially helpful because the number of courses offered would cease to be a criterion of comprehensiveness. Theprogram provides for great flexibility in learning experiences and increased contact between students and teachers. The guidance function of every teacher would be emphasized, the clock would cease to regiment the school day.

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[1] Florence B. Stratemeyer, Hamden L. Forkner, Margaret G. McKim and A. Harry Passow, Developing a Curriculum for Modern Living, Second Edition, revised and enlarged, New York, Bureau of Publications, Teachers College, Columbia University, 1957, p. 402.

[2] Will French and Associates, Behavioral Goals of General Education in High School, New York, Russell Sage Foundation, p. 39.

A Four-Period Day Featuring "Majors" and "Minors"

In a unique effort to get the advantages of long periods the Watchung Hills (New Jersey) Regional High School categorized its courses into "majors" and "minors" and designed its schedule around a four-period day. All periods are ninety minutes in length. The majors meet three times per week, the minors, twice. Each student takes four majors and one minor. For illustrative purposesthe four majors for each grade level are designated "A," "B," "C," and "D" in the schedule below.

Four-Period Day

Monday	Tuesday	Wednesday	Thursday	Friday
Major 12A	Major 12D	Major 12A	Major 12D	Major 12A
Major 11A	Major 11D	Major 11A	Major 11D	Major 11A
Phys Ed 10	Minor 10	Homerm 10	Phys Ed 10	Minor 10
Major 9A	Homerm 9	X Per 9	Homerm 9	Major 9D
Major 12B	Major 12C	Major 12B	Major 12C	Major 12B
Major 11B	Major 11C	Major 11B	Major 11C	Major 11B
Major 10A	Homerm 10	X Per 10	Homerm 10	Major 10D
Minor 9	Phys Ed 9	Homerm 9	Minor 9	Phys Ed 9
L	U	N	C	H
Major 12C	Homerm 12	X Per 12	Homerm 12	Major 12D
Phys Ed 11	Minor 11	Homerm 11	Phys Ed 11	Minor 11
Major 10B	Major 10D	Major 10B	Major 10D	Major 10B
Major 9B	Major 9D	Major 9B	Major 9D	Major 9B
Phys Ed 12	Minor 12	Homerm 12	Phys Ed 12	Minor 12
Major 11C	Homerm 11	X Per 11	Homerm 11	Major 11D
Major 10C	Major 10A	Major 10C	Major 10A	Major 10C
Major 9C	Major 9A	Major 9C	Major 9A	Major 9D

*Copy of the schedule obtained from the Superintendent of Watchung Hills Regional High School, Dr. A. Gordon Peterkin.

Eleven courses are available to the 108 Seniors as "Major 12A" (first period on Monday, Wednesday and Friday) at Watchung Hills:

English
French III
Latin III
Spanish III
Chemistry
Physics
Geometry
Stenography
United State History
Advanced Shop
Advanced Home Economics

Some of the offerings available in Major 12A are listed along with other courses available in other periods for majors. Multiple-classes have been used for some of the small-enrollment classes in foreign languages. Among the minors open to seniors are industrial arts, music appreciation, fine arts and home arts.

All students have three homeroom periods for guidance, supervised study and the coordination of all activities other than athletics and music. Two periods are for physical education and an X period is for health or a special-interest pursuit in connection with a course. Typing, shop or home economics, fine arts and music are scheduled for nine weeks each as part of the required minor for freshmen.

Superintendent Peterkin indicated that the schedule has given teachers more opportunity to express initiative and creativity in teaching and more opportunity to attend to individual learning problems of students. He is somewhat concerned about the lack of schedule balance, particularly as it applies to freshmen and sophomores who spend all ten afternoon periods of each week in classes devoted to majors, whereas only two of such classes are scheduled among the ten morning periods. Foreign language teachers at Watchung Hills express doubt that three long periods per week are as effective as more frequent short periods for vocabulary work where drill and memorization are important. The same objection might be applicable to typing classes because of the advantages some teachers claim for frequent short practice sessions. These objections may be relieved soon, however, when a new language laboratory and the typing laboratory may be made available to students outside of the regularly-scheduled classes.

It is significant that the staff accepted the challenge of differentiating time allotments to majors and minors, thereby evidencing their belief that all subjects are not "equal." In addition to this decision, the school decided to run a special activity period after the regular dismissal time.

Certain features of this schedule might be more acceptable to CAP schools than the modified Rockland schedule because it carries all subjects through to what would be Regents weeks in New York, and the utilization of just three periods for majors allows the adoption of long periods without greatly increasing the number of conflicts. Although CAP schools could make the second afternoon bus run for the late activity-period participants, the conflict of music and athletics would be inappropriate for the smaller schools in which so many students participate in both. However, the athletics could run late as suggested and two of the homeroom periods could be used for music. The frequent face-to-face contact of students and teachers in the small CAP schools would probably decrease the need for the number of homeroom periods appropriate to a larger school.

The Modular Schedule*

CAP schools are not in a favorable position for the adoption of core programs or concentration plans because of the Regents Examination and long-developed suspicion of the core's effectiveness. Whatever these 22 schools do for program development will most likely be based upon subject-matter organization which is spread throughout the semester or the school year. Thus the final schedule example in this chapter turns attention to a new type of time organization--one designed to return to a semblance of compartmentalization and yet enhance the scheduling of individual students according to their learning needs.

Smaller, more maneuverable time increments or "modules" replace typical periods in the modular schedule. Periods become flexible in length and frequency because they may be scheduled from one to 25 modules in an infinite variety of patterns or omitted entirely. The following table does not show what period combinations are possible, but it depicts the relationship of modules, the length of periods, and the number of periods in a six-hour school day.

TABLE XXII

Relationship Between the Number of Modules,
Length of Periods, and the Number of
Periods in a Six-Hour School Day

Number of Modules	Length of Periods (in minutes)	Number of Periods
1	15	24
2	30	12
3	45	8
4	60	6
5	75	4 (+4 modules)
6	90	4
8	120	3
12	180	2
24	360	1

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*The name, "modu[illegible]" was suggested by Dr. David B. Austin, Professor of Education, Teachers College, Columbia University.

In order to picture the schedule at work in a small school it is necessary to first turn attention to teacher assignments. On the assumption that the school is small enough to have only one English teacher and one social studies teacher, the science and mathematics teachers join them in general education assignments in the mornings and all are used on a specialized basis in the afternoons. Other teachers are used in line with their specialties throughout the day.

The four teachers shown on the sample schedule in Figure 1 would not be scheduled to meet students on Monday afternoons. Students would be scheduled with the other teachers in physical education, graphic arts, business education, work experience, foreign languages and other areas. In the other four afternoons the general education teachers would become specialists and meet students. For example, the English teacher who concentrates upon the basic communication skills for grades nine, ten, elven and twelve in the morning sessions (11th and 12th are remedial), turns greater attention in the afternoons to special areas drawn from general education --speech, drama, journalism, school annual, literature and creative writing.

Most of the teachers who give full attention to special areas arrange their planning periods and their sessions with grades eight and below for the first three or the last three modules in the morning. All ninth and tenth graders and most of the eleventh and twelfth graders will be group scheduled at these times. Elasticity in scheduling for individual needs is obtained by the use of modules four through nine each day except Monday. Individuals are retained in some phase of the general education program or go to special areas related to their needs. Special teachers are on call for appearances in the general education program. The Monday afternoon sessions could be used by the four general education teachers to plan together or separately.

Time	Modules	English						Social Studies						Mathematics						Science					
		Mon.		Tues-Fri.				Mon.		Tues-Fri.				Mon.		Tues-Fri.				Mon.		Tues-Fri.			
		9	10	9	10	11	12	11	12	9	10	11	12	9	11	9	10	11	12	10	12	9	10	11	12
8:45	1	x		x					x				x		x			x		x			x		
	2	x		x					x				x		x			x		x			x		
	3	x		x					x				x		x			x		x			x		
	4	x		x	x	x	x		x	x	x	x	x		x	x	x	x	x	x		x	x	x	x
	5	x		x	x	x	x		x	x	x	x	x		x	x	x	x	x	x		x	x	x	x
to	6	x		x	x	x	x		x	x	x	x	x		x	x	x	x	x	x		x	x	x	x
	7	x		x	x	x	x		x	x	x	x	x		x	x	x	x	x	x		x	x	x	x
	8	x		x	x	x	x		x	x	x	x	x		x	x	x	x	x	x		x	x	x	x
	9		x	x	x	x	x	x		x	x	x	x	x		x	x	x	x		x	x	x	x	x
	10		x		x			x				x		x		x					x				x
	11		x		x			x				x		x		x					x				x
11:45	12		x		x			x				x		x		x					x				x
11:45-12:30							L			U		N			C			H							
12:30	13					x	x			x	x					x	x	x	x					x	
	14					x	x			x	x					x	x	x	x					x	
	15					x	x			x	x	x	x			x	x	x	x			x	x	x	x
	16					x	x			x	x	x	x			x	x	x	x			x	x	x	x
	17					x	x			x	x	x	x			x	x	x	x			x	x	x	x
to	18					x	x			x	x	x	x				x		x				x	x	x
	19					x	x			x	x	x	x				x		x				x	x	x
	20			x	x					x	x	x	x			x	x	x	x			x			
	21			x	x					x	x	x	x			x	x	x	x			x			
	22			x	x					x	x	x	x			x	x	x	x			x			
	23					x	x			x	x					x	x	x	x			x			
3:30						x	x			x	x					x	x	x	x			x			

FIGURE 1

Sample Schedules for Four Teachers in Small School Using a Modular Schedule

The scheduling process for Tom Green, hypothetical tenth-grader, is not as complicated as Tom's schedule eventually implies. Since teachers are on duty as consultants and teachers of multiple-classes most of the time during the day, Tom can first be scheduled in the usual way. His schedule is then modified to allow him to take the electives of his choice, and it is modified in the general education program according to his needs in science and English.

Tom Green's Schedule Before Modular Modifications

1	M	T	W	Th	F
2					
3	Science				
4					
5	(double period)				
6					
7					
8					
9					
10	English				
11					
12					
	LUNCH				
13					
14	Typing				
15					
16					
17					
18					
19	Industrial Arts				
20					
21					
22					
23	Chorus	Library	Chorus	Library	
24					

Tom would be quite unhappy with such a schedule, because he also wishes to take mechanical drawing, physical education and he wishes to work on the school newspaper staff. But the staff, aware of Tom's educational history and his goals, plan with him and modify his schedule in the following manner. Typing is dropped on Monday and Friday and replaced by physical education and newspaper, respectively. Industrial arts, though dropped on Tuesday and Thursday, is scheduled for longer periods on Wednesday and Friday. Mechanical drawing takes the periods dropped by industrial arts. By adjusting other times a newspaper period is scheduled for Tuesday afternoon, and Tom's program is completed when his teachers decide part of his time for general education in the mornings may be devoted to typing, mechanical drawing and physical education.

When the afternoon typing and chorus are shortened to 45 minutes (three modules) Tom's schedule looks much different.

Tom Green's Schedule After Modular Modifications

	M	T	W	Th	F
1	Science	Science	Science	Science	Science
2					
3					
4					
5		Typing		Phys. Ed.	Typing & Newspaper
6			Mech. Drwg		
7					
8					
9	English	English	English	English	English
10					
11					
12					
	LUNCH	LUNCH	LUNCH	LUNCH	LUNCH
13	Phys. Ed.	Typing	Typing	Typing	Newspaper
14					
15					
16		Mech. Drwg	Ind. Arts	Mechanical Drawing	Mechanical Drawing
17	Ind. Arts				
18					
19					Industrial Arts
20		Newspaper		Library	
21					
22	Chorus		Chorus	Chorus	
23		Library			
24					

Although most of his classes outside of the general education program are multiple-classes, all of Tom's classes meet as units at least once each week.

The continuation of the imaginary journey with Tom finds him mastering personal typing to his satisfaction by Thanksgiving. He drops the typing periods on Tuesday, Wednesday and Thursday but remains in the Friday combination session with the school newspaper. He starts driver education in the dropped typing periods and he applies modules five and six on Tuesdays to the science course, which has not been going satisfactorily. His progress in mechanical drawing is excellent so he is excused from Wednesday and Friday classes during December to increase the time on his Christmas project in industrial arts. The end of the first semester finds Tom doing much better work in English, but the science has not responded to the addition of the two modules added at Thanksgiving. A conference of the science and English teachers with the guidance counselor produces the suggestion that Tom shift modules seven and eight on Tuesdays from English to science.

Tom's teachers are reacting to the unique demands of the small high school as they were set forth 23 years ago by portions of The Small High School at Work.[1] His subject matter program is versatile, it adjusts readily to his needs. He is a member of many different small groups and he has opportunity to work alone in projects related to his unique interests.

The modular schedule does not rely upon arbitrary units as organizational base. Typically, schools hold time constant and allow varying achievements to emanate from students on a fixed schedule. The Winnetka Plan and Morrison Technique allowed the time spent in a course to vary, but achievement was held constant--mastery of the same material was required of all.[2] The modular schedule attempts neither of these extremes but aims at the appropriate program for each student. Time may be adjusted and goals may be adjusted as a teacher, guidance counselor and student plan together to design a unique learning program.

Changing most students' programs daily or weekly would quickly lead to confusion. But if the need for changes are recognized through periodic appraisals the changes should and could be made with a modular schedule in a small high school where the need for precision organization is not oppressive. This schedule may be an approach to one which works more like a roadmap than a railroad timetable--the schedule dream of Dr. Frank Cyr, Executive Director of CAP. Despite the timetable appearance provided by fifteen- or twenty-minute divisions the modular schedule may greatly enhance the small school's opportunity to capitalize on smallness. A coordinated staff approach in a well-integrated and versatile small school may allow a schedule which is attractive in theory to become operationally effective.

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[1] R. Emerson Langfitt, Frank W. Cyr and N. William Newson, The Small High School at Work, New York, American Book Co., 1936, esp. p. 244-56.

[2] Ibid., p. 247-48.

CHAPTER IV

BUILDING THE MASTER SCHEDULE

Schedule development consists of making decisions about the fundamental purposes of the school and decisions about the best deployment of resources to enhance realization of the purposes; and it unavoidably involves the clerical operations related to gathering, organizing, and, finally, expressing these data in the form of assignments for teachers, students, rooms and time--the master schedule itself.

The first three chapters of the Guidebook have been primarily devoted to the first phase of schedule development. The master schedule is pervasive. It affects all teachers. It affects all learning activity. Such an important administrative device merits the consideration of the complete staff, and insights provided by students on CAP questionnaires indicated that they, too, can make important contribution to schedule development.

Austin has added to involvement the reminder that schedule-building should be a continuous process.

> . . . certain kinds of information can be developed without pressure of emergency demands, . . long-term planning can be employed, . . . many decisions can be made after planning conferences and following careful deliberation which promises better decisions than snap judgments may produce.[1]

Changes which are to be made in the program of general education and/or the offerings in special areas should be made before spring--before students' programs for the following year get "final" approval. Continuous appraisal of students' progress should be related to future demands upon the schedule. What shall be done about repeaters? What can be done for the especially talented? Individual programs should be planned early, and then, reviewed, changed where needed and approved in the spring. Those who relate these important aspects of education to the master schedule accept it as one basis for planning and appraising the performance of the school. In this context, schedule-building can be an appreciated responsibility.

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[1] David B. Austin and Noble J. Gividen, The High School Principal and Staff Work Together on the Schedule, New York, Bureau of Publication, Teachers College, Columbia University (in press).

But clerical operations associated with scheduling are sometimes onerous and the disappointment which may come from the inability to satisfy all desirable schedule objectives can spoil a year which has generally been a good one for the schedule-builder. It would be presumptuous of the Study Group to go into great detail about this second aspect of schedule development because the gathering and ordering of data must be done with knowledge of the priorities established for the organization of each school; and concentration on one method of schedule-building would do injustice to others which may be as good or better for a particular situation. Nevertheless, some brief treatment of schedule-building may shed new and helpful light upon an important and necessary job. The following steps are essentially some of those from "the order of events" for conventional schedule-making, as suggested by American High School Administration.[1]

Steps in Schedule-Building

1. Prepare a list of tentative offerings as a result of the judgments made about next year's program needs.

2. Provide pupils and parents with this list. It should probably be mimeographed and designed in such a way that the student could indicate his present and former experiences on it. Expression of his future desires should be based upon considered judgment resulting from his guidance conferences and from discussion shared with parents. The choices made should have the approval of a parent and the counselor.

3. Student choices should be tabulated. Students may be given code numbers, and the use of different colored ink for each grade level may provide a tabulation sheet which depicts information clearly enough to make a conflict sheet unnecessary. In small schools the number of sections for classes is readily obtained.

4. Determine what staff changes are likely to occur as the result of retirements, resignations and other influences, and make tentative teacher-assignments.

5. Make a conflict sheet unless the situations in steps 3 and 4 make it unnecessary. This sheet should show all subjects, but general education courses need not be tabulated except for repeaters and other irregular cases. (Form 3 in Appendix C is an illustration of a portion of a machine-made conflict sheet.)

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[1] Will French, J. Dan Hull and B. L. Dodds, American High School Administration: Policy and Practice, Revised Edition, New York, Rinehart and Co., 1957, p. 281-87.

6. Prepare a tentative schedule. This may be done on a grid on a large sheet of paper upon which changes are made by pencil and eraser, or it may be done with a pocket-chart, peg-board or other device. At this stage the schedule will probably be easier to read if teachers' names are across the top and the periods are numbered vertically along the side.

Most CAP classes are singletons, but those which are not should generally be placed on the trial schedule last unless shared-service teachers or other special circumstances consign them to certain periods. Ivok suggests that the sequence be modified by starting with twelfth-grade singletons and going to the rest of the twelfth-grade courses, eleventh-grade singletons, other eleventh-grade subjects, in that order, and continuing until all subjects are assigned.[1] The low-enrollment electives should then be checked for multiple-class groupings for those teachers willing to accept them. Room assignments should be made and entered on the schedule.

Some CAP guidance counselors start the tentative schedule by blocking the eleventh- and twelfth-grade general education courses against each other in order that pupils might have freer access to electives open to both groups. One school found it advantageous to schedule physical education first, another gave music high priority. Such practices emphasize the uniqueness of each situation and point to the limitations of a suggested priority list.

An acute weakness in some schedules for small schools results from starting the tentative schedule for the top four grades before the group scheduling for the seventh and eight grades has been taken into account. Sometimes the vital need of junior high youngsters are arraigned against the high school's "left-over" staff rather than given the priority they deserve. Most CAP schools avoid this by assigning appropriate teachers for homeroom and/or double periods for these youngsters.

7. The tentative schedule should be posted or distributed for examination by teachers. Oversights may be caught, teachers may have helpful suggestions. Programs for students with irreconcilable conflicts must be re-examined. In some instances courses may be changed without sacrificing program value for the students, but in others unique needs warrant the utilization of special courses by correspondence or film if a multiple-class arrangement is unacceptable.

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[1] Leo Ivok, How to Prepare a Schedule for a Secondary School, Harvard Workshop Series No. 5, Cambridge, Mass., Harvard University, 1944.

8. Mimeograph the amended schedule as "offical." Although unforeseen circumstances may make its change appropriate, this schedule should be used if reasonably possible because it represents the expressed needs of the students.

9. Period numbers are entered on students' registration forms and class lists are made.

Although it is realized that the preceding steps will not obviate the tedious and time-consuming attention sometimes necessitated by unexpected July and August resignations, they may reduce the work to a "bearable" level. As yet, there is no completely automatic way to build or revamp the master schedule itself.

Application of an Electronic Computer to Scheduling Operations[1]

Dr. Frank W. Cyr, Executive Director of CAP, has often urged the Study Group to investigate possibilities for automatic scheduling because he was aware that scheduling is a complicated process which often involves more facts than the mind can efficiently recall and relate. Furthermore, clerical operations necessary to organize these facts and express them in a master schedule represent costly investment of time and energy by guidance counselors and principals.

Unsuccessful in earlier attempts to learn more about the possibilities of machine scheduling, the Study Group finally got a very informative report in its meeting April 13, 1959. Dr. Austin and the Study Group's secretary discussed a very interesting session they had shared with Dr. Nathan Jaspen, an automation specialist who is actually involved in the development of master schedules for two rather large (1400 and 2000 students) suburban high schools near New York City. Jaspen, pleased to talk with someone interested in his schedule research, immediately endeavored to relieve his interviewers of any naivete they may have had concerning electronic computers.

"The computer is a first-class moron. It remembers what it has been 'told.' It cannot look into the future. It cannot exercise judgment. To the extent that data can be mathematically interpreted in a manner I can communicate to the computer and for a mathematically-expressed purpose I can also communicate, the computer is highly useful. It can replace the slave labor associated with gathering and putting schedule information in useful form. It can provide more complete and more useful data than can be manually obtained for schedule development. But it cannot build a master schedule."

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[1] Most of this section is based upon a conversation with Dr. Nathan Jaspen, Ph.D., Director of Statistics and Automation Services for the National League for Nursing, New York City, April 10, 1959.

The mathematician then went on to explain that the use of the electronic computer to assist in scheduling is not financially realistic at the present time. Were it not for Jaspen's special access to the IBM machines he would have lost a considerable sum in the scheduling he has done to date (at a cost of one dollar per student). It takes about one minute of machine time to process each student, but the rent on the computer (the IBM #650) is eighty dollars per hour. This alone would represent a loss of one dollar for every three students. However, continued study should lower the machine-time to twenty or thirty seconds per student, thus making the process more reasonable financially.

Before explaining the steps involved in machine scheduling Jaspen stressed the necessity for maintaining close attention to the "human aspects" of the educational program the schedule must serve. As a person outside the official school family, he cannot assign teachers, change students' programs and make decisions which are appropriately the school's. He must have the results of these decisions, however, in order to build a schedule. Thus his communication with the principal and/or the guidance counselor is frequent.

The procedures used by Jaspen were discussed and oriented to the sample forms shown in Appendix C.

1. Form 1 is the list of course offerings (referred to earlier in schedule steps one and two). After student registrations have been placed on copies of this form and approved, they are sent to the machines for the punching of IBM program cards.

2. Electronic tabulations then produce Form 2, which shows registrations by courses. (Such a form for 1000 students can be produced in about ten minutes.) This then goes back to the school for decisions on teacher assignments (three and four under "Steps in Schedule-Building").

3. The electronically designed conflict chart, Form 3, dramatically reveals the computer's advantage in doing routine sorting and tabulating. The complete chart is on a matrix which can account for 100 courses (100 vertical and 1000 horizontal items). Thus it is a matrix of 10,000 divisions. Tabulations for 1000 students can be arraigned on this matrix in two hours. Schedule builders working manually do not get information so complete, so accurate, and so fast (five in "Steps in Schedule-Building").

From this machine-made conflict chart it is possible to visualize the schedule dilemma of small schools which try to offer a wide variety of courses. If a school doubles its number of courses the matrix on the conflict chart is quadrupled. Conflict possibilities vary as the square of the number of courses offered. When the overwhelming majority of these courses are singletons, conflicts are even more inevitable. It is slight solace to say, "One person's conflict is another's opportunity."

4. Form 4 is developed to see that class load is evenly distributed throughout the school day. This illustrates another machine advantage because most schedule-builders would ignore this as a manual operation, or they would do it with greater time and energy than it merits, or (most likely) they would make adjustments to balance class load as they develop the schedule itself.

5. The computer, an ingenious aid in developing Forms 2, 3, and 4, has given the schedule-builder more complete information than he could otherwise assemble, but it must stand idly by while a more wonderful instrument, the human brain, makes the judgments responsible for the development of Form 5, the master schedule (six in "Steps in Schedule-Building").

Before starting the development of the schedule, Jaspen consults with the school to learn what schedule decisions--numbers of periods, their length, frequency, etc. he must respect.

The computer has helped hammer information into a size which can be handled. Testimony to its assistance is revealed by the fact that Jaspen has developed schedules with remarkably few conflicts (18 and 14 conflicts for 2000 and 1400 students) when compared to schedules based upon less complete data. This is even more amazing when it is realized that he is restricted in his opportunity to make judgments which a counselor or principal could make almost automatically concerning program changes for individual students.

After developing a tentative schedule, Jaspen goes back to the school, gets decisions on the irreconcilable conflicts and the program changes they necessitate. Then he gets school approval of the final schedule (seven in "Steps in Schedule-Building").

Although he did not completely close the door on the possibilities for developing Form 5 on the computer, Jaspen did not lack confidence in his belief that it cannot be done. He explained that the matrix required to handle such a problem is larger than can be accommodated by the drum of the 650 computer or any other commercial computer. He said, "The master schedule may be like the trisection of an angle--incapable of solution."

After Form 5 is approved the computer is used to distribute the students into the classes. Here again, advantages of the machine are asserted--particularly, for scheduling large schools with several sections in many courses. The machine schedules students individually, not in groups. This makes it possible for Jaspen to "tell" the machine any special scheduling restrictions which must be applied to any particular student--and the machine "obeys."

6. Forms 6, 7, 8 and 9--student, teacher and room schedules, and class lists--are prepared and printed on the machines. They represent more schedule information than the small school sometimes deems essential but they are useful, and they add appropriate finishing touches to significant improvement in schedule development.

The automation specialist is not hopeful that his scheduling processes could be adapted to small schools in the immediate future because the cost would be proportionately much higher than the cost of scheduling large schools, but he believes that the present cost can be reduced in time.

Dr. Nathan Jaspen, in supplementing his unusual talent with an electronic computer, is undeniably making significant contribution to the more efficient development of better master schedules. He has gone far beyond the usual schedule operations adapted to IBM equipment by several schools across the country.[1,2] CAP's challenge is to stimulate his concern for the schedule problems of small schools.

The Use of Marginal Punch Cards in Scheduling

Although the use of the computer in scheduling small schools is apparently not currently feasible, marginal punch cards have great application for scheduling and record-keeping, according to a demonstration of their use by Professor David B. Austin of Teachers College, Columbia University.[3] The use of the cards is based upon the sorting potential which comes from correct assignment of items to "clipped" and "unclipped" positions. The clipped positions refer to those for which the margin between the factory-made holes and the edge of the card should be clipped, or opened. The holes are not violated for unclipped items. The manner in which "sex" is indicated on the cards is illustrated. The clipping pattern calls for the clipping of boys' cards only.

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[1] "High School Scheduling Done by I.B.M. Machines," Personnel and Guidance Journal, 35:568, May, 1957.

[2] Calvin E. Anderson, "A Study of the Problems Encountered in the Installation and Utilization of Automatic Accounting Machines in Student Record Keeping in Secondary Schools," Doctor of Education Project Report, New York, Teachers College, Columbia University, 1958.

[3] In the Study Group meeting at Oneonta, New York, April 13, 1959.

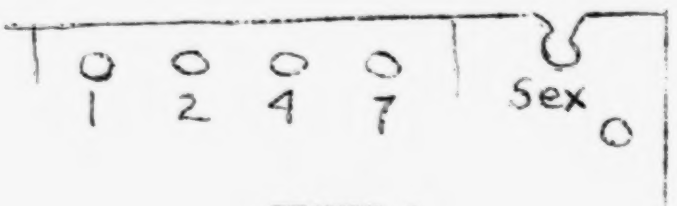

FIGURE 2

Portion of Boy's Marginal Punch Card (Clipped)

When a sorting needle is inserted through the upper right corner of a stack of cards and lifted, the cards for the girls remain on the needle, the boys' cards will drop. A hundred or more cards might be sorted into the two categories in a moment.

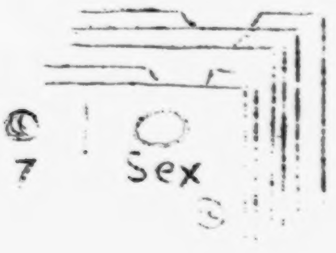

FIGURE 3

Cards Aligned

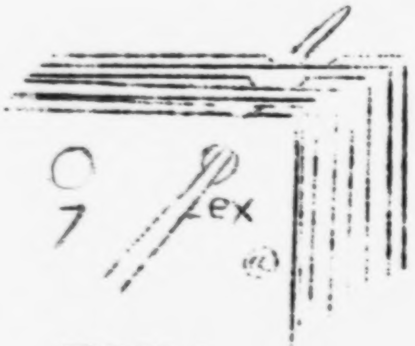

FIGURE 4

Needle Inserted

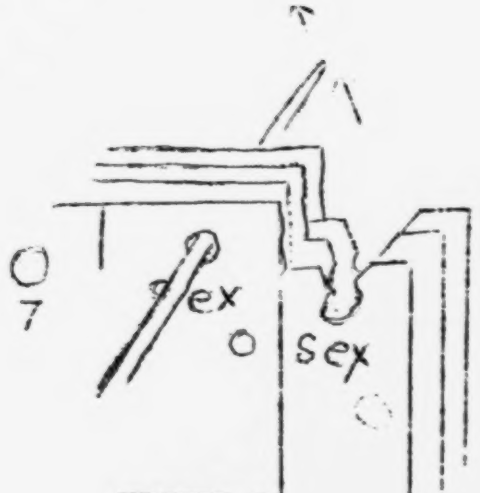

FIGURE 5

Needle Lifted to Separate Girls' and Boys' Cards

The procedure for using punch cards in scheduling should be followed while keeping "Steps in Schedule-Building" in mind.

1. Develop a course offerings sheet. It would be helpful to follow Jaspen's coding idea and key offerings to the code followed for hand-clipping marginal cards.

2. Have the students transfer the codes and/or the course names and their own names to unclipped cards.

3. Clip the cards according to the adopted code and clipping pattern, remembering the principle, "Clip the least number of holes possible by assigning required courses and other items which recur most frequently to unclipped positions."

4. Use the sorting needle to develop the course lists and the conflict chart.

5. Determine staff needs.

6. Build a tentative master schedule.

7. Complete the scheduling process as suggested by "the order of events," using the sorting operation for developing class lists.

It was apparent that several members of the Study Group were very interested in punch card possibilities. A meeting was held May 4, 1959 with a representative of the Royal-McBee Company to further examine their use. SomeCAP schools will use the cards in building 1959-1960 schedules. Short of the future possibilities for machine scheduling, the use of these cards seems to offer the most helpful way to improve the clerical aspect of schedule development.[1]

The basic operations to be performed in any schedule action, however, are related to the nine steps discussed early in this chapter. A thorough understanding of them and the implementation of them with constant regard for the human considerations not revealed by a mass of schedule data are the keys to better schedule development.

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[1] James F. O'Brien, "A New Look in Schedule Building," The Bulletin of the National Association of Secondary-School Principals, 42:102-06, October, 1958.

CHAPTER V

TOWARD BETTER SCHEDULES AND SCHEDULING

Recommendations

After studying the results of over 400 questionnaires, considering direct observation of current CAP experimentation and reflecting upon all the schedule deliberations over a two-year period, the Study Group is, in a sense, "recommendation conscious." Some members are reluctant to suggest schedule change without more assurance than that provided by the evidence and argument accumulated to date, but most--aware that the extent of schedule experimentation in CAP is, for the most part, limited to "innovations" which the literature traces to 1909--seem anxious for the schools to "get ready" for significiant schedule change. The following implications and recommendations are therefore provided.

1. Since schedule study may be improved in local schools and in the meetings of the Study Group, it is recommended that each CAP school be requested to have a representative regularly participate in the Study Group meetings.

2. Since teachers and students in CAP schools using 57- or 58-minute periods report that learning advantages have resulted from the longer periods, since educational literature reports achievement advantages for longer periods, and since X periods increase the potential for schedule flexibility, floating-period schedules are appropriate for most CAP schools to use while they are developing plans for further departure from schedule tradition in the future. The success of the schedule in the smaller CAP schools will not match that of the larger ones unless multiple-classes are the rule rather than the exception. The Study Group recommends that most CAP schools give careful consideration to the adoption of a floating-period schedule and a six-period day.

3. Since significant schedule improvement in small schools will probably result in the offering of small-enrollment electives in multiple-classes, teachers will be called upon to do many different things. They will react most appropriately to such schedule assignments if they are properly oriented to them. It is recommended that in-service education programs be devoted to increasing teacher competency and security as they relate to multiple-class teaching.

4. Since it will be necessary to develop "models" for highly significant schedule innovation, and since such innovation with rotations, modular schedules or other change possibilities will be

meaningless unless they reflect change in the processes of teaching and learning, CAP leadership is urged to (a) encourage more widespread experimentation in all schools, and (b) extend concentrated effort, with appropriate technical and financial assistance, to get staffwide commitment to CAP experimentation--particularly in multiple-classes and technological aides--in one, two, or three schools.

5. Since it will no doubt be difficult to get complete staff agreement on large-scale experimentation without considerable financial assistance to provide time and assistance for local staffs to conduct thorough studies, other CAP schools should look for small-scale schedule endeavors for testing schedule hypotheses. Schools are doing little in implementing present schedules for more flexibility. It is nevertheless significant that a few teachers (39 of 234) occasionally extend the length of a period, and the schools with X periods occasionally move them to provide more appropriately for assemblies and other activities. These cases of schedule implementation increase the hope that ideas of schedule rotation and/or modular schedules may be tried as implementations of schedules the schools will actually use in 1959-1960. These ideas are logical possibilities for experimentation which will have limited effect on the total school, and they may provide important opportunity for staff study and appraisal before widespread experimentation is undertaken. It is therefore recommended that schools make particular effort to study rotations and the modular schedule during the next school year and apply the ideas to portions of schedules in operation at that time.

6. Since time patterns and schedule mechanics have received most of the attention of the Study Group in past meetings greater attention in the future should be turned to other schedule dimensions. Multiple use of facilities is an important schedule consideration in small schools, especially. (The design of buildings which enhance versatility is of prime importance in programming. It is to receive warranted attention from a separate group of people.) The most serious neglect by the Study Group, however, is that which relates to schedule content. It is therefore recommended that the Study Group members--most of whom are principals or guidance counselors and intensely interested in the broad aspects of school programs--focus much attention in 1959-1960 on determination of what courses should be offered in most CAP schools.

7. Since the clerical operations in schedule-building may be handled more effectively with marginal punch cards (all of the clipping or punching and much of the sorting may be done with students or office personnel), some CAP schools are going to use them in 1959-1960. The Study Group recommends that the "punch card" experiences of these schools be exchanged and that they be shared with other schools in order to improve and expand their use.

8. Since electronic computers can be used with great effectiveness in scheduling operations, their application to the schedule problems of small schools should be pursued. Emphasis should be directed to two phases of this application. First, the streamlining or reorganizing of presently used operations should make them economically feasible for small schools. Second, renewed attention should be given to obtaining even more information from the computer than it provides with present use.

The IBM 650 computer already handles matrices of 100 by 100 in developing conflict charts with 10,000 coordinates. Thus, in most CAP schools it should be able to handle a matrix in which the courses being taken by the students make one dimension and the students themselves make the other. Such a chart would not produce the master schedule, but it would add one more important set of data to those already available to schedule-makers. The conflict chart indicates what courses should not conflict. It is believed that the course-student chart would allow the conflicts to be quickly related to particular students. The need for multiple-classes could be quickly assessed and the extent of modification necessary to change a traditional schedule into a modular schedule could be more quickly and accurately determined.

The Study Group is not certain that the chart would have all the values just claimed--it may have less or more--but there is considerable confidence that such a chart could be made and that Dr. Nathan Jaspen could reliably gauge its contribution to improved scheduling. Perhaps Jaspen could also provide valuable quantitative relationships between the schedule problems of schools in which all courses are singletons and those in which required courses are offered as doubletons or tripletons. Since he can provide great service to education by pointing the way to new and better scheduling techniques or by more clearly identifying obstacles to better scheduling, it is urgently recommended that CAP endeavor to get Dr. Nathan Jaspen to devote one week in each of the next twelve months to studying CAP schedule problems with whatever assistance he may derive from the computer.

9. Since the use of marginal punch cards and the possibilities of machine scheduling may call for materials and/or services not readily available to small schools, it is recommended that the district superintendents of schools and the local schools investigate the possibility of providing materials and services from the boards of cooperative services.

10. Since, however, the building of the master schedule is so intimately identified with the human considerations involved in school organization, the Study Group provides the reminder that punch cards and computers are inanimate and incapable of making judgments. It is therefore strongly recommended that the principal and/or

the guidance counselor remain the the focal point in the schedule-building process.

Need for self-study

The Study Group believes the preceding recommendations are important--they seem to be the logical outgrowth of joint endeavor. But they are likely not to be read by staff members and if read, they will soon be forgotten. In the libraries of colleges and universities throughout the country there are many shelves lined with studies which produced seemingly important recommendations for school practice and public schools have been remarkably successful in avoiding their implications.

Schools usually change very slowly, but sometimes relatively rapid and significant change occurs. Corey underscores the Guidebook's earlier reminders for staff involvement in local schedule study when he states that the more dramatic changes in schools come when the associated research is conducted within the schools by the teachers themselves.[1] This observation has been true of CAP schools and it likely characterizes them in the future. If they are to make schedule changes commensurate with the need for change, the individual schools must undertake serious self-study.

Experimentation in Local Schools

In a speech to CAP's General Conference, December 2, 1958, Dr. Stephen M. Corey emphasized that action research involves the identification of a problem, the development of a hypothesis, the testing of the hypothesis in practice, the accumulation of evidence and the evaluation of the practice.[2] It may be somewhat misleading to set these facets of action research into definite sequence because the research, particularly in relatively small groups and in an informal setting may run the gamut of these study phases several times. Quite often the development of a hypothesis causes re-examination of problem definition, practice may force alteration of the hypothesis, evidence may clear illusions about practice and suggest its modification, and evaluation--through involving an "apart" perspective which forces appraisal on "results" or "proof"--has a dimension which places it in the ongoing practice as part of the assessment-modification-reassessment-modification cycle which sets the learning environment for children apart from the dispassionate "controlled" experiments in the scientific laboratory.

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[1] Stephen M. Corey, Action Research to Improve School Practices, New York, Bureau of Publications, Teachers College, Columbia University, 1953.

[2] Dr. Corey is Dean of Teachers College, Columbia University.

Thus, the focus on action research may shift from one aspect of the process to another and back again, but the research--if it is to be fairly assessed for improvement potential--must have a consistency which allows valid description and appraisal in terms of its objectives.

Since schedule study in any school is different from any other research the Study Group believes some modification in the research sequence suggested by Corey is in order. It may be possible, as suggested earlier in this chapter, that rotations and modular adjustments may be worked out on a small-scale basis. But this in a sense is "preliminary" activity--it does not approach the sweeping proportions of a basic change in a master schedule, and the evidence accumulated in more permeating change may not accurately reflect the implications of a piece-meal approach.

Therefore, the importance of accumulating evidence for the prediction of consequences in schedule change may be more important than in research which allows individual teachers to abandon or modify an experiment in progress. It is suggested, therefore, that the sequence of Corey's recommended research steps be modified to emphasize the importance of preliminary schedule study. The fact that accumulation of evidence is discussed primarily in "preliminary planning" in the following series does not negate its importance during the processes of practice and appraisal.

Identification of the problem

Evidence has been cited to show that the schedule of small schools typically feature short periods and they are built around narrow educational programs. The small high school's endeavor to imitate the specialization of large high schools has resulted in many very small classes. Because of the many conflicts related to schedules in which all or most of the courses are offered as singletons, conflicts are numerous if school organization restricts each schedule cubicle to one teacher and one class.

There is general need for periods longer than the typical forty- to forty-five minute periods allotted each class in most small schools. Teachers and students cannot sufficiently capitalize on the opportunity small schools provide for frequent interaction in learning activities. The learning program is designed to fit the schedule. The short periods, narrow programs and conflicts add up to restricted opportunity for many youth.

But each school must identify its own problems. "We do not have enough supervised study," "boys' vocational program limited to agriculture," "multiple-classes need more time"--whatever the local problem is, it should be phrased in specific terms.

Development of a hypothesis

Each school should establish a hypothesis which grows out of an examination of need and which is compatible with the realities of the situation in that school. The hypothesis may be somewhat vague.

"We can provide a better educational program if we change our schedule."

But it would be much improved if the hypothesis were more specific.

"We can provide a better educational program if we . . ." (Insert the specific schedule characteristics desired.)

The potential value of the hypothesis would be even more improved, however, if the basic purpose of change is more clearly identified.

"We can offer a broader program through multiple-classes and make this program more effective (the purpose should fit the particular school situation) if we change our schedule by introducing a floating period and increasing the length of most of the periods (substitute schedule characteristics appropriate to the local school)."

The Study Group, in recommending local study and hypothesizing, points to the schedule ideal and principles established in the first chapter of the Guidebook as appropriate background consideration for every CAP school. They are here repeated.

An ideal schedule is one in which each student would follow the learning program uniquely appropriate for him. The schedule principles are: (a) Schedule design must make it possible for students to have a greater variety of educational experiences than is usually available in the small high school, (b) Schedule design must provide that most periods be longer than the forty- to forty-five minute periods customary in small schools in order to enhance increased personal interaction between the teacher and the individual student, and (c) Schedule design and implementation must facilitate changes in the organization of school days or weeks from time to time if learning advantages would accrue.

The fact that one or all of the above considerations may not be acceptable to a particular school does not destroy their value for study, for increasing the perspective of those who must make schedule judgments and decisions. Out of broad perspective should grow a hypothesis related to specific goals for the orientation, practice and assessment of innovation.

Preliminary planning

If the first two steps have been properly undertaken the study would be underway at this point. The pattern of an experiment may be shaped in part by the extent and nature of involvement of the staff in the preliminary steps.

Eight CAP schools made basic schedule changes since the 1956-1957 school year by changing the number of periods in the school day. Five of them indicated that faculty committees had been appointed to study schedule changes and teachers had a voice in the final decision concerning change.[1] Teachers in these five schools reported that the changes favorably affected teaching and learning, and their satisfaction resulting from the change remained unchanged or increased.

TABLE XXIII

Teacher Responses (70) to the Question,
"In General How Do You Feel that the Present Schedule,
When Compared to the Previous One,
Affects Teaching and Learning?"

Favorably	52
Unfavorably	6
No change	12

TABLE XXIV

Teacher Responses (75) to the Question,
"Has the Schedule Change Affected Your General
Satisfaction with Your Job?"

Increased satisfaction	33
Decreased satisfaction	6
About the same	36

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[1] See Appendix B, Staff Questionnaire, Questions 36 and 37.

Teachers from three schools which made basic schedule changes answered negatively to questions about involvement and reported less favorable attitude toward schedule changes and the effect of the changes on morale.

TABLE XXV

Eighteen Teacher Responses (from the "No Involvement" Schools) to the Question, "In General How Do You Feel that the Present Schedule, When Compared to the Previous One, Affects Teach ng and Learning?"

Favorably	8
Unfoavorably	7
No change	3

TABLE XXVI

Seventeen Teacher Responses (from the "No Involvement" Schools) to the Question, "Has the Schedule Change Affected Your General Satisfaction with Your Job?"

Increased satisfaction	3
Decreased satisfaction	5
About the same	9

A 100 per cent reply from teachers in the eight schools would have provided 103 responses from the first group of teachers and 46 in the second. Though the teacher responses from the second group of schools is small in percentage and number their contrast to those from the larger group is significant. Involvement is important.

But it should be carefully planned. Tables XXIII through XXVI indicate that only two of every three teachers who reported favorably on the effect of change on teaching and learning also reported that their job satisfaction has increased. This prompts the observation that--in some instances--schedule convenience may be more important to teachers than the influence of the schedule on the school program.

One school endeavored to increase involvement by extending invitations to all the faculty to attend meetings of the schedule committee. Usually only two or three non-committee teachers would attend, but all teachers attended at least one of the schedule meetings. Such plans might be applicable to a school which senses that a faculty committee can sometimes be isolated from the rest of the faculty by hostility.

Questions about involvement. Despite the fact that frequent face-to-face contact enhances the cooperative endeavors of small schools, the experience of the five "involvement" schools was not uniformly smooth or successful. Smallness is no excuse for ignoring ground rules needed to guide a particular study.

1. Should there be a committee appointed to study scheduling?

2. If so, what are the limits of responsibility and authority possessed by the committee?

3. How can complete staff involvement be facilitated?

4. Should students participate in the study?

5. Should lay citizens be invited to participate? The board?

6. How shall the results of the study be reported to the administration? The faculty? The student body? The board? The community?

7. Who gives final approval of recommended changes?

Other planning considerations. Answers to the following questions should affect the design of the experiment.

1. How can we find out how many boys and girls could not take courses they wanted because of conflicts? Because the courses were not offered? (Remember that 88 of 193 seniors suggested that schools "offer more courses.")

2. How could missed opportunities have been made available by multiple-classes, correspondence courses, alternation of courses, films (one girl in a CAP school took an entire physics course by film because a conflict kept her out of the regularly-scheduled classes), shared services, and the use of school aides to allow a greater percentage of teacher time to be devoted to the classroom.

3. How can we get longer periods and more supervised study?

4. How should the learning goals of youth affect the time they spend in various courses?

5. What schedule changes can be made which will improve the educational program and find teacher acceptance?

6. How shall we assess the effect of the schedule changes on learning and teaching?

The preceding questions are provided merely for illustrative consideration. Each school should develop a unique study design. Corey, though emphasizing the importance of design, indicates that it should not be rigid. It should not deter a staff from making adjustments when they appear appropriate. It should not become more important than the interests of the students.

"The initial design of action research cannot be inviolable. . ."[1]

Accumulation of evidence. Evidence obtained in the survey of the Secondary School Report forms (1958-1959) highlighted the influence of tradition on the schedules of the central schools in New York, but it gave little indication of the direction schedule experimentation should take. The Study Group's survey of teachers and students reinforced the need for schedule changes, but it went further and endorsed supervised study as highly desirable. Students, particularly, desire a more comprehensive educational program. Teachers were not quizzed about comprehensiveness, but several volunteered such statements as "too many conflicts," "lack of variety of offerings," "not enough courses," "need enrichment courses," and "have more multiple-classes."

The more important value of questionnaire results pertain to their use for individual schools. Although the responses of individual teachers were not made available to schools, each of the nineteen schools which returned teacher questionnaires has been provided with a summary of the responses in that particular school. The seven schools which participated in the student survey have received similar summaries of the schedule reactions of their seniors. These summaries contain considerable information which may be helpful to schedule studies in the separate schools.

They do not provide enough information, however, for schools to proceed to change their schedules. Staffs need to study their local situations in accord with respective designs established. As comprehensive data are accumulated their relationship to the various schedule patterns shown in chapter three of the Guidebook should be assessed.

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[1] Stephen M. Corey, Action Research to Improve School Practices, New York, Bureau of Publications, Teachers College, Columbia University, 1953, p. 11.

Practice and appraisal

The Study Group is inclined to favor longer periods in schedules and the use of floating periods to achieve them in schools which can provide doubletons in most required courses. Doubletons, however, become singletons when one course is divided into "Regents" and "non-Regents" courses. At this point schools must determine priority. Which is more important--ability grouping or the availability of more courses (the reduction of conflicts) for students? Practice in one school which used the floating-period schedule and abandoned it, and in another which is seriously considering similar action, point to its limitations in quite small schools where music programs cannot compete with class schedules and where clearing one period for music forces too many conflicts in elective classes. These disadvantages can be offset or turned into advantages, however, with widespread use of multiple-classes. In a more idealized sense the modular schedule has been offered for possible trial by schools, but it may represent a more abrupt break with tradition than schools can smoothly handle. A possible compromise would be to apply it to one portion of the school day--for two or three hours--and give it a thorough testing throughout a year to see how effective it can be.

However, it is not the purpose of the Guidebook to determine the best schedule for a particular school. It is the school's responsibility to select a basic design, modify it to fit its situation, and put it into practice. Practice should grow out of the goals established, the nature of the design and the evidence accumulated.

Each school must make intelligent compromise between what it wants to do and what it can do because change--as important as it is--must be planned in accord with apparent reality. At the risk of redundance it is emphasized that a schedule is of importance only to the degree that it serves worthwhile school purposes. Schedule change then, should be planned in accord with anticipated results in the educational program.

On one questionnaire a teacher wrote (in answer to a request for identifying schedule weaknesses), "I am opposed to a flexible schedule because its only purpose is so we can say we have one."

Either this school did not establish the purpose for change or the purpose was not communicated to the teacher.

In another school a multiple-class teacher said, "Allow the student to report to me whenever he is free and I'll see that he gets the course."

The difference in the above situations is not represented by the clock. (The schedule in the second school is considerably more flexible than the one characterized as "flexible.") The difference more likely reflects the opportunity and the willingness of the teachers to focus on fundamental tasks of the school.

"Practice and appraisal" have been deliberately coupled in the Guidebook (Corey sometimes couples them, sometimes separates them) because action research in scheduling demands that appraisal accompany operation. This is the "feedback" Corey talked about at the CAP General Conference. But appraisal should not be confined to "the atmosphere," it should represent an honest attempt to relate the effect of schedule change to its purpose.

> . . . that to the degree we work through . . . change . . . constantly pushing in the direction of greater objectivity and disciplined inquiry, we increase the assurance that the change we introduced represents improvements.[1]

If a basic schedule change is made in a school it should be clear that the experiment has a right to fail as well as succeed, it should be made in a situation where evaluation can proceed objectively. This does not mean that control groups must be established but it emphasizes the need for clarity in objectives and freedom of opportunity to assess progress toward those objectives.

Observation of some CAP schools which have made schedule changes revealed bright spots where most teachers saw beyond the time changes and focused on the job in the classroom--they were assessing and reassessing opportunities for improved learning and teaching.

The Study Group could not characterize this as typical of the eight schools which changed schedules, however. Involvement was sometimes absent, sometimes poorly planned. There were isolated instances where schedule disagreements among members of a given staff were accompanied by hostility.

But change does not occur without pain, without the sacrifice of cherished practice. No one realizes better than the teachers, counselors and principals of the experimenting schools that the CAP scheduling innovations are just a first step. But they are getting the "feel" of experimenting, acquiring the desire to probe for schedule implementation which may make significant strides forward in the search for the schedule ideal. And the ideal is not as unrealistic as is sometimes imagined. Note what one enterprising CAP school does in the course of seven fifty-minute periods with two full-time teachers and one part-time teacher. Teacher B is available for only four periods.

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[1] Stephen M. Corey, from a mimeographed transcript of his speech in Oneonta, New York, December 2, 1959, p. 6.

Period	1	2	3	4	5	6	7
Teacher A	Elem. Algebra ㉓	Driver Euc. ⑯	Geometry ⑬	8th Arithmetic ㊴	Algebra II ⑥ Trig. ④ 11th Yr. Math. ⑦	Math. Review (Fri. only) ⑥	
Teacher B		Latin II ④ Latin III ②	Latin I ⑪	French I ⑪ French II ④	German I ① Latin II ⑥ French III ①		
Teacher C		Study Hall ㊴	Elem. Art	Art & Mech. Drw'g ⑪*	Art & Mech. Drw'g ⑫*	Elem. Art	8th Art ㊴

Note: The encircled numbers represent class enrollments.
*Combined enrollments for art and mechanical drawing.

FIGURE 6

A Portion of a Schedule Which Shows Three Teachers Assigned to 22 Classes and One Study Hall Within Sixteen Periods

The school represented by the above schedule has made desirable schedule changes, but the implementation of the schedule is ahead of the design. When an entire staff becomes totally committed to such implementation some form of the modular schedule may become a reality.

But neither the modular schedule nor any other single recommendation of the Study Group on Flexible Scheduling is a panacea for the schedule ills of small high schools. Continued schedule improvement will come from the kind of insight that penetrates to basic educational purposes. It will come from school personnel who can feel secure in a cooperative reaction to challenge--a cooperative probing of the dynamic process of education to find ways of improving it.

The Task Ahead

When the Study Group wrote in the first chapter that the small high school must "seek earnestly to escape the bonds of tradition," it was writing of relative change. If complete rebirth were possible in small school philosophy and practice it would probably be unwise. Tradition is no more to be completely rejected than blindly followed. Change should not result from haphazard guesses and it should not occur so rapidly that teachers and students become uneasy because of failure to adjust to new purposes and practices--it must be by evolution rather than by revolution.

But rural high schools are generally more traditional than their city cousins, thus the need for high school experimentation is acute, especially in matters of teaching techniques and organization of the school day.[1] Change should focus on a departure from "class" organization to organization geared to the needs of individuals and small groups. Learning should be recognized as a highly personal process related to the capacities and needs of each student. Teaching should be seen as a highly professional process of better understanding unique perceptions, better motivating and more purposefully sharing in the learning activities of others.

There is need for change--and there is opportunity. The inherent qualities of smallness--frequent face-to-face contact, informal atmosphere, ease of identity and involvement, versatility--enhance the liklihood that the staff and students may cooperatively identify problems and plan approaches to their solution.

The schedule in small schools is not a cause of limited opportunity, but a reflection of futile endeavors to deploy small school resources in a pattern typical of larger schools. The Catskill Area Project in Small School Design, its sister project in the Rocky Mountains, and isolated schools across the country are trying to find ways to preserve the strong inter-personal relations inherent in small high schools and build upon them effective comprehensive educational programs.[2] Increased attention is being given to combining educational resources of the school and community, breaking down subject matter lines, utilizing correspondence courses, organizing multiple-classes, increasing and improving the use of tapes, films, television and other communication devices, achieving better utilization of staff, and greater use of personnel and services available from intermediate units. Upon a background of these areas of experimentation attention should be turned to the master schedule. Without the potential they represent for comprehensive and high-quality education schedule innovation will merely be an academic exercise.

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[1] Knute O. Broady, "Small School Systems," Encyclopedia of Educational Research, Edited by Walter S. Monroe, Revised Edition, New York, The MacMillan Co., 1950, p. 1055-59.

[2] Rocky Mountain Area Project. A cooperative research project involving the Fund for the Advancement of Education, the Colorado State Department of Education and thirteen small high schools in Colorado.

A flexible schedule is not a plan for a day of little divisions which require routine appointments for given students in given classes. It is large blocks of time--the whole school day, week and year--which have been organized so that the experiences for each young person are the most appropriate ones for him. The youth of one moment is not that of the next. He is forever different. The challenge in scheduling is to make the moments serve him--not regulate him.

> So the role of an indigenous American secondary school - free, public and state-supported - becomes that of producing, as far as school education can, healthy, self-supporting, socially conscious, morally upright and rationally behaving young men and women who as homemakers, as workers and as citizens of their school, community, state, nation and the world are able and willing to defend, maintain and improve our American way of life. The historical secondary school being exclusive, selective and authoritarian in spirit could not and did not have such a major function. Our high schools - inclusive, adaptive and democratic - today are engaged in the process of freeing themselves from the chrysalis of the past and - too slowly and uncertainly - are taking on a form and program which can more effectively perform the function of a truly American high school.[1]

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[1] Will French, "The Role of the American High School," The Bulletin of the National Association of Secondary-School Principals, 39:9, February, 1955.

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APPENDIX A

Student Questionnaire

CATSKILL AREA PROJECT IN SMALL SCHOOL DESIGN
State University Teachers College
Oneonta, New York

STUDENT QUESTIONNAIRE ON SCHEDULING

Name of your school ______________________________

A. This part of the questionnaire is about your schedule this year.

1. What subjects are you now taking? (Please list the courses according to the periods they are scheduled. Include scheduled study halls.)

1st period ______________________________

2nd period ______________________________

3rd period ______________________________

4th period ______________________________

5th period ______________________________

6th period ______________________________

7th period ______________________________

8th period ______________________________

9th period ______________________________

10th period ______________________________

2. Are all of your class periods the same length?

193 Yes
_____ No If "no," do you think this causes confusion?
_____ Usually
_____ Sometimes
_____ Rarely
_____ Never

3. Do any of your classes change their position in the schedule from day to day during the week?
120 Yes
73 No If "yes," does this cause confusion?
4 Usually
13 Sometimes
28 Rarely
28 Never
47 "Omits"

4. Do you like the idea of classes changing their position in the schedule from day to day during the week?
____Yes
____No (Table XVIII, p. 39)
____No opinion

5. When do you get your studying done during the school day?
162 Study hall
31 Supervised study during a part of the class periods
44 Other times (Please specify) Home or combinations of home with study hall and/or supervised study.

6. If you have a regular study hall period are you able to get help in it for your assignments?
69 Most of the time
77 Sometimes
31 Rarely
8 Never

7. Do your teachers generally set aside a part of the regular class period for supervised study?
____Yes (Table XV, p. 36)
____No If "yes," are you able to get help on assignments in class?
____Most of the time
____Sometimes
____Rarely
____Never

8. Do you feel that enough time for study is provided during the school day?
158 Sometimes
27 Rarely
8 Never

9. Do you have enough opportunity to use the library?

127 Most of the time

46 Sometimes

15 Rarely

5 Never

10. If you have a study hall period can you use this for library work?
114 Most of the time
70 Sometimes
4 Rarely
3 Never If "never," when do you get library materials? ____________________
____

SCHEDULING

11. If you have supervised study during class are you able to get library materials you need?

	Long period schools	Shorter period schools
_____Most of the time	48	29
_____Sometimes	41	23
_____Rarely	7	15

_____Never If you answered "never" when do you get library materials? Study hall (2 students from long period schools answered "never"; 11 students from shorter period schools did same.)

12. Do you believe that teachers have enough time to give you the help you need?
88 Most of the time
74 Sometimes
23 Rarely
8 Never

13. Does the present schedule provide enough time for extra-curricular activities?
158 Yes
35 No If not, why not? ____________________

14. Is your lunch period long enough?
2 Too long
91 Too short
99 About right
1"omit"

15. If you believe the present lunch period to be too long or too short, what length period would you suggest? (Remember that the length of the lunch period affects the length of the school day.) _____ minutes

30 minutes (11); 40 min. (19); 45 min. (16); 60 min. (34)

Why? Line too long. Too rushed.

B. Answer the next 12 questions only if your school's master schedule of classes is basically different from other schedules you remember from your high school experience.

1. When was your school's schedule last changed?
_____This year (4 schools)
_____Last year
_____Two years ago
_____Three years ago (1 school)
(no change in 2 schools)

2. How does the length of the periods in the present schedule compare with the length of those in the old schedule?
____Longer (4 schools)
____Shorter (1 school)
____Same

3. Is there as much time for study under the present schedule as there was under the former schedule?
____More
____Less (Table XVI, p. 37)
____Same

4. How much do you use the library under the present schedule as compared with the old schedule?
____More
____Less (Table XVI, p. 37)
____Same

5. Do you get to know the teachers as well, or better, or not as well under the present schedule as under the former schedule?
____Better
____Not as well (Table XVI, p. 37)
____No difference

6. Are you able to get as much help from teachers under the present schedule as you did under the old one?
____More
____Less
____Same (Table IX, p. 29)

7. How does the length of the lunch period compare with that of the former schedule?
____Longer (1 school)
____Shorter (3 schools)
____Same (1 school)

8. Which lunch period do you prefer?

	Shorter this year	Longer
____This year's	27	45
____One in old schedule	56	5

9. Is there enough time for extra-curricular activities under the present schedule as compared to the old one?
____More
____Less (Table XX, p. 42.)
____Same (Please explain) ______________________________

____

____

10. How does the number of home room periods per week in this year's schedule compare with the number of home room periods in the old schedule?
_____More (1 school)
_____Less (2 schools)
_____Same
(2 schools)___No home room periods in either schedule

11. How does the length of home rrom periods in the present schedule compare with that of the former one?
_____Longer (2 schools)
_____Shorter (1 school)
_____Same
(2 schools)___No home room periods in either schedule

12. In general, how do you like the present schedule when it is compared to former one?
_____Better
_____Worse (Table X, p. 30)
_____About the same

C. What suggestions do you have for schedule improvement?
_____Make periods longer
_____Make periods shorter
_____Offer more subjects (Table XIV, p. 35)
_____Offer fewer subjects
_____Have more time for activities
_____Have less time for activities
_____Have more study hall periods
_____Have fewer study hall periods
_____Have more supervised study within the classroom
_____Have less supervised study within the classroom
_____Have more laboratory time
_____Have less laboratory time
_____Have more home room time
_____Have less home room time
_____Have more shop time
_____Have less shop time
_____Lengthen the lunch period
_____Shorten the lunch period
_____Lengthen the school day
_____Shorten the school day
_____Vary the length of class periods
_____Have all periods the same length

_____Have class periods revolve (Each class should meet at different times of the day during the week. An English class would meet sometimes in the morning and on other days in the afternoon).
_____Class periods should not revolve
Other ____

____

____

APPENDIX B

Staff Questionnaire

CATSKILL AREA PROJECT IN SMALL SCHOOL DESIGN
State University Teachers College
Oneonta, New York

PROFESSIONAL STAFF QUESTIONNAIRE ON SCHEDULING

Name of your school ____

Definitions

Supervised study--Study within the classroom or individual study under the supervision of the classroom teacher. This is differentiated from the "recitation" part of the period traditionally devoted to group instruction and from independent study in the study hall or library.

Flexibility--Schedule adaptability to change. There are possibilities for schedule variation if warranted by the learning needs of students.

• • •

1. Your years of teaching experience __________ Years in this system ____

2. What subjects are you currently teaching? ____________________

    ____

    Other staff responsibilities (principal, vice-principal, guidance, etc.)

    ____

3. When was the last basic change made in the master schedule of your school?
    ____1958-59
    ____Within the last four years
    ____Other

4. Were you teaching at this school before the schedule change went into effect?
    ____Yes
    ____No

5. How many periods a day does your schedule have? _____ (Do not include lunch period unless classes or activities are also scheduled then.)
    Four schools have six periods, five have seven, twelve have eight, and one has a nine-period day.

6. Does each of your classes meet every day of the week?
    ____Yes
    ____No If "no," please explain. ____________________
    (In 5 schools, classes meet four times per week.)

7. How many periods a week do you teach? _____ (Do not include study halls.)
    (See Table XXI, p. 44)

8. How many study halls a week do you supervise? ____(Table XXI, p. 44)

9. How many free periods do you have per week? ____(Table XXI, p. 44)

10. If there has been a basic change in the master schedule since you taught at this school, how does the present schedule compare with the old one with respect to the length of the periods?
_____Longer (7 schools)
_____Shorter (1 school)

11. According to the experience in your school what has been the relationship between the number of discipline problems and the length of class periods?
15 Longer periods have more discipline problems
7 Shorter periods have more discipline problems
55 No difference

12. Is part of your class periods spent in supervised study?
_____Yes
_____No
If "yes" how many minutes? ________
If "yes,"how often:

Long	Short	
9	1	_____Always
51	44	_____Usually
11	23	_____Rarely

Long periods
80 "yes" (15-20 min.)
20 "no"

Short periods
68 "yes" (5-10 min.)
54 "no"

13. Do the students have time to finish their assignments in class?
_____Most of the time
_____Sometimes
_____Rarely (Table XIII, p. 34)
_____Never

14. Does the present schedule provide enough time for you to work with students?
_____Most of the time
_____Sometimes
_____Rarely (Table VII, p. 28)
_____Never

15. If there has been a basic change in the master schedule how does the present schedule compare with the old one regarding the amount of time for working with students?
_____More time in this schedule
_____Less time in this schedule (Table VIII, p. 29)
_____About the same

16. Which best describes the characteristics which you feel are the advantages and disadvantages of supervised study?

a. Advantages (Table XVII, p. 38)
_____More opportunity to help students
_____More opportunity to enrich program for better students

(16. continued on page 3.)

____Better opportunity to become acquainted with students
____More opportunity for special work with slower students
____More opportunity to use library facilities
____More opportunity to help develop better study habits
____More opportunity to use supplementary materials
____Other (Please specify) ____________________

____

b. Disadvantages (Table XVII, p. 38)
____Period too long for students' attention span
____Period too short to allow both instruction and study
____Planning of assignments more complicated
____Difficult to make library assignments
____Better students finish lesson too soon
____Other (Please specify) ____________________

____

17. If your school provides supervised study are the students able to get the library materials they need?
110 Most of the time
24 Sometimes
11 Rarely
1 Never

18. In what ways, if any, do you feel that provisions for study time and the use of the library would be improved in your school by changing the schedule?

Separate library and study hall (8); More periods (5); Longer periods (5); More supervised study (4); Put the study hall in the library (2); Take classes out of library (2)

19. Do you feel students have sufficient time to use the library?
127 Most of the time
50 Sometimes
18 Rarely
8 Never

20. If you taught under the previous schedule do you feel that students are learning as rapidly under this schedule as under the old one?
____More rapidly
____Less rapidly (Table XI, p. 31)
____About the same

21. If you taught under the old schedule has the present schedule caused you to change the way you organize learning activities?
____Yes
____No If "yes," what changes have you made? (Table II, p. 15)
More or better planning (9); More variation in
planning (7); Plan for individuals (3)

22. What is your opinion of schedules in which classes "revolve" or change position in the schedule from day to day during the week?
____Excellent practice
____Probably good practice
____Probably a poor practice (Table XIX, p. 40)
____Definitely a poor practice
____No opinion

23. Is continuity of learning affected when classes meet less often than five times per week?
____Frequently
____Sometimes
____Rarely (Table XII, p. 32)
____Never

24. Do you teach any subject for which the length of class periods varies during the week?
22 Yes (agriculture, science, transcription)
206 No If "yes," does this affect your planning?
4 Much more difficult
4 More difficult
2 Less difficult
0 Much less difficult
8 About the same

25. If you teach academic subjects how do you feel about the length of period in your present schedule?
____Too long
____Too short
____About right (Table VI, p. 27)

26. If you teach non-academic subjects how do you feel about the length of period in your present schedule?
____Too long
____Too short
____About right (Table VI, p. 27)

SCHEDULING

27. Under the present schedule do you have sufficient time for preparation?
115 Most of the time
36 Sometimes
37 Rarely
12 Never

28. How does your preparation time compare to the planning time in the previous schedule?
13 Present schedule is better
20 Present schedule is worse
37 About the same

29. If part of your class is not spent in supervised study, why not?
38 Does not apply to my subject
37 Period is too short
37 Other study time scheduled (study hall, library, etc.)
_____Other (Please specify) Varies (2); Discussion often more important (2)

30. Do you have supervisory duties during the lunch hour?
114 Yes
98 No If "yes," how often? Varies from once per week to four weeks per year.
If "yes," how many minutes per day? 15-45 min.(mode, 20min.)

31. How do you feel about the length of the lunch period?
10 Too long
56 Too short
140 About right If not "about right," please comment on your answer. Need time to relax or rest (20); Supervision problems in long lunch periods (7)

32. In general how do you feel that the present schedule, when compared to the previous one, affects teaching and learning?
_____Favorably
_____Unfavorably
_____No change
(Table XXIII, p. 91 and Table XXV, p. 92)

33. Has the schedule change affected your general satisfaction with your job?
_____Increased satisfaction
_____Decreased satisfaction
_____About the same
(Table XXIV, p. 91 and Table XXVI, p. 92)

34. Do you feel that teachers had enough voice in deciding schedule changes?
57 Yes (6 schools)
21 No (2 schools)
18 No opinion

35. Did the original suggestion for change come from teachers?
33 Yes (3 schools)
28 No (4 schools)
39 Do not know (one school)

36. Was a faculty committee appointed to study schedule changes?
____ Yes (5 schools)
____ No (3 schools)
____ Do not know

37. Did teachers have a voice in the final decisions concerning schedule change?
____ Yes (5 schools)
____ No (3 schools)
____ Do not know

38. Do you ever have opportunity to extend a class period so that it lasts two, three or more times the length of the usual period?
39 Yes
____ No If "yes," how is this arranged? Arrange with other teachers (6); Arrange with principal (4); Use activity period (3); Use study hall (3)

If "yes," do you then omit this class on other days in order to compensate for the "excess" schedule time the class had for the long period?
____ Yes
26 No

39. If you answered "no" to the first part of the previous question would you occasionally like to extend the length of a class period as described above?
110 Yes
65 No

40. Would you sometimes like to hold classes for double periods but meet just half as many times?
63 Yes
125 No

41. Do you feel that it is important to balance schedule time so that all academic classes would meet the same number of hours over the semester?
158 Yes (In other words, should mathematics, English, foreign
26 No languages, social studies, etc. meet the same number of periods during the semester?)

42. How does the idea of flexibility in schedule design and implementation appeal to you?
129 Favorably
33 Unfavorably
37 No opinion

43. What ideas--no matter how abstract or how impractical they may seem to you--do you have for increasing the flexibility of master schedules?

More supervised study and/or longer periods (7): Hire more teachers (5): More periods (4); Ability grouping (4); Double periods at times and/or sacrifice periods at times (3)

44. Please list what you feel are the strengths of your present schedule.

Schools with periods 45 min. or less	Schools with longer periods
Regularity (9)	Length of period (27)
Variety of subjects (7)	Supervised study (31)
Length of period (6)	More individual attention (24)
Activity schedule (6)	Fewer study halls (18)
	More student initiative expressed (13)
	Relief from monotony (5)

45. Please list what you feel are the weaknesses of your present schedule.

Schools with periods 45 min. or less	Schools with longer periods
Too many study halls (15)	Teachers overloaded (10)**
Periods too short (9)	Teachers don't use supervised study (8)
No time for indiv. help (6)	Reduces electives (7)
Too many conflicts (5)	Short noon hour (6)
Lack variety (5)	Limits activities (6)
	Classes don't meet daily (5)

*Four teachers said: "Too many study halls for slow learners."

**All 10 responses from the same School.

46. What suggestions do you have for improving the present schedule?

Schools with periods 45 min. or less	Schools with longer periods
Have longer periods (11)	Add a period (10)*
More supervised study (5)	Return to short periods (5)
Rotate the schedule (3)	Need more teachers (4)
Eliminate study halls (3)	Need more rooms (3)
	Separate band and other activities (3)
	Have classes 5 times per week (2)

Your name (optional) ____________________

---

*Three teachers stated their desire for a longer school day. Even though they want "more periods," they do not want "shorter periods."

APPENDIX C

IBM Schedule Forms

Last name (print) ____________________ First name ______________

sex ____________ Class ________ Birth date ______________

Note: Encircle the symbol of each course that you will be taking in 1959-1960. Ignore the code column.

Course	Units	Hrs	Symbol	Code
Art				
Basic Art	1.0	5	ABA	101
Ceramics—Sept.	0.5	5	ACE	702
Water Color—Feb.	0.5	5	AWC	803
Crafts—Sept.	0.5	5	ACR	704
Graphic Art—Feb.	0.5	5	AGA	805
Advertising Design—Sept.	0.5	5	AAD	706
Contemporary Painting—Feb.	0.5	5	ACP	807
Art Appreciation—Sept.	0.5	5	AAX	708
Art Appreciation—Feb.	0.5	5	AAY	809
Oil Painting	1.0	5	AOP	110
Business				
General Business	1.0	5	BGB	151
Business Mathematics	1.0	5	BBM	152
Bookkeeping	1.0	5	BB	153
Distributive Education 1	2.0	5	BD1	154
Distributive Education 2	2.0	5	BD2	155
Typing	1.0	5	BT	156
Personal Typing—Sept.	0.5	5	BPX	757
Personal Typing — Feb.	0.5	5	BPY	858
Shorthand 1	1.0	5	BS1	159
Shorthand 2	1.5	10	BS2	970
Secretarial Practice	1.0	10	BSP	971
Office Practice	1.0	10	BOP	972
Business Law	1.0	5	BBL	173
Economics of Business	1.0	5	BEB	174
Citizenship Education				
World Geography G	1.0	5	CIG	201
World Geography R	1.0	5	C1R	202
World Geography E	1.0	5	C1E	203
World History G	1.0	5	C2G	204
World History R	1.0	5	C2R	205
World History E	1.0	5	C2E	206
American History G	1.0	5	C3G	207
American History R	1.0	5	C3R	208
American History E	1.0	5	C3E	209
Problems of American Democracy G	1.0	5	C4G	210
Problems of American Democracy R	1.0	5	C4R	211
Problems of American Democracy E	1.0	5	C4E	212

FIGURE 7

Illustration of IBM Form 1, Course Offerings
(Portion only—Actual Form Lists 124 Different Courses)

Code	Symbol	Soph	Jr.	Sr	Total
101	ABA	48	8	13	69
702	ACE		14	1	15
706	AAD		9	6	15
708	AAX			4	4
110	AOP		2		2
401	ID1	25	8	13	46
201	C1G	79	26	26	131

FIGURE 8

Illustration of IBM Form 2, Course Registration by Year
(Portion only)

……………………

	ABA	ACE	AAD	AAX	AOP	ID1	CIG
ABA		3		1		5	2
ACE	3					1	
AAD				1			
AAX	1		1				
AOP						1	
ID1	5	1			1		7
C1G	2					7	

FIGURE 9

Illustration of IBM Form 3, Course Conflict
Chart (Portion only)

……………………

	1	2	3	4	5	6	7	8	Total
ABA			16		16			16	48
ACE									
AAD									
AAX									
AOP									
ID1		8		8		9			25
C1G	20		20		20		19		79

FIGURE 10

Illustration of IBM Form 4, Hourly Load by Class—
Sophomores (Portion only)

	Period							
Course	1	2	3	4	5	6	7	8
C1G			Jacks 214		Jacks 214			O'Shea 212
C1R			Banner 219				Banner 219	
C1E	Baker 222	Wagner 224	Green 210	Banner 210	Wagner 224	Banner 210	Green 214	Banner 210
C2G	Green 214						Wagner 224	
C2R		Green 214						Green 214
C3G								Taub 223
C4R	Taub 223	Baker 222	Baker 222	Taub 223	Jones 222	Taub 223		Baker 222

FIGURE 11

Illustration of Form 5, the Master Schedule (Portion only)

	1	2	3	4	5	6	7	8
M	SCE 11 202	PE12 24 107	Study 31 213	MIA 41 122	Lunch 51	LL2 61 117	E3R 72 210	C3R 81 223
T	SCE 11 207	SCE 11 207	Study 31 213	MIA 41 122	Lunch 51	LL2 61 117	E3R 72 210	C3R 81 223

FIGURE 12

Illustration of IBM Form 6, Student Schedule
(Portion only—Wednesday and Friday
are the same as Monday; Thursday is the
same as Tuesday)

••••••••••••••••••••••••••••••••••

	1	2	3	4	5	6	7	8
M	C4E 11 224	C3E 21 224		C4E 41 224	C3E 51 224	Lunch 61	C3E 72 224	
T	C4E 11 224	C3E 21 224		C4E 41 224	C3E 51 224	Lunch 61	C3E 72 224	

FIGURE 13

Illustration of IBM Form 7, Teacher Schedule
(Portion only—Wednesday, Thursday and
Friday are the same as Monday and Tuesday)

	1	2	3	4	5	6	7	8
M	E4E 11 227	E4E 21 227	E3E 31 227	E4G 41 227	E4G 51 227	E3G 61 227	E4G 71 227	E4R 81 227
T	E4E 11 227	E4E 21 227	E3E 31 227	E4G 41 227	E4G 51 227	E3G 61 227	E5G 71 227	E4R 81 227

FIGURE 14

Illustration of IBM Form 8, Room Schedule
(Portion only--Wednesday, Thursday and Friday are
the same as Monday and Tuesday)

……

JACKS, Muriel D. (Teacher) C1G 51 214

Room 214

Anders, Paul	M10	C1G	51	214
Baker, Rose	F10	C1G	51	214
Ball, Nancy	F10	C1G	51	214
Caulder, Sally	F10	C1G	51	214
Cooper, Tom	M10	C1G	51	214
Doe, Joseph	M10	C1G	51	214
Ligman, Samuel	M10	C1G	51	214
Maller, Malcom	M10	C1G	51	214
Melder, Marion	F10	C1G	51	214
Miller, Joyce	F11	C1G	51	214
Miller, Kenneth	M10	C1G	51	214
Nappy, Christine	F10	C1G	51	214
Newman, Nancy	F10	C1G	51	214
Painter, Anne	F10	C1G	51	214
Porter, George	M11	C1G	51	214
Schuyler, David	M10	C1G	51	214
Stoddard, Stanley	M11	C1G	51	214
Staufferman, Doris	F10	C1G	51	214
Tote, Mary Ellen	F10	C1G	51	214
Vail, Marvin	M10	C1G	51	214
Williams, James	M10	C1G	51	214
Wilson, Whit	M10	C1G	51	214
Woods, Marlene	F10	C1G	51	214

FIGURE 15

Illustration of IBM Form 9, Class List